

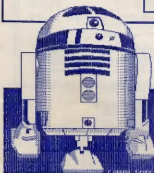
MARCH/APRIL '88
Vol. 4 No. 3
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Time Design



GREAT GRAPHICS

Left: "R2D2" by Carl Green,
East Liverpool, Ohio, using
ARTWORK (Havelsaft). Right:
"Musical Art" by Dennis A.
Zacharias, Tulsa, Oklahoma,
using ARTWORK and TECHDRAW
(Zebra). Below: "Winter" by
Bill Boehm, Bedford, Mass.,
using QL PAINT (Sinclair).



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Magazine

MARCH/APRIL '88

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FROM THE EDITOR'S CLUTTERED DESK

Tim Woods

Just as I had predicted in our last issue, my editorial entitled "SEND IN THE CLONES" opened a can of worms, but in a much more favorable light than I had anticipated. And, along with our on-going Reader Survey, the TDM Mail Box was literally bursting at the seams! (Only one person, however, wrote to tell me that they had caught on to the what I thought was, an appropriate title. It's from a Judy Collins song that was made popular in the 70's--"Send In The Clones". That one person was my good friend, the ever-talented Paul Bingham, who thought I should have included musical notes along with the title!!)

As it turns out, I now know (thank goodness) that I probably won't be the last Sinclair user around. There are many, many of you who still feel that there is quite a bit of life left in those silver and black boxes. Others of you, it seems, due to professional commitments (or whatever) dabble with the more expensive machines, but still are very interested in what is going on here in TDM and the Sinclair community.

Then finally, there are those of you who never intended to stay with us for very long anyway. The flashier "bells and whistles" are just too much of a temptation. Please do us all a favor, and sell (or give) your Sinclair computer to someone who would use it...and also give them your back issues of TIME DESIGNS (if you no longer want to read them).

Overall, I feel that "IBM PC and Clone bashing" would be an unproductive activity for us to follow. (But I don't know how many times we've heard our favorite machines bashed to death!) There is probably a great deal of info we could gain from our PC, Atari, Apple, and Commodore friends.

I closed the "Send In The Clones" editorial on a positive note...which I would like to expand on a bit. There are those of you who have accused me of being too positive for "sugar-coated". Of course I am aware of folks who have left our midst, and that some of the user groups have died on the vine. But I am equally aware of groups that are still "on fire" and can pack in 50 to 60 users at meetings, and also some fascinating research and development that is being conducted right now with our computers.

Why concentrate on "belly aching" and "crying" about how bad things are? Why not instead work together on some neat hardware and software projects. Let's recruit new members (and try to find those that have "hand-me-down" computers). Let's also try to turn around such negative bad nothing we receive, by showing others what we can do...and start by having a **POSITIVE ATTITUDE** ourselves!

I don't seem to get up on a high and mighty soap box, but I am tired of hearing negative comments

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Continued On Page 4.

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even from our own users! Often I have found that the root problem is frustration. There is so much that could be done by others in this area, if someone is frustrated, a simple question for questions answered goes a long way. More than often, its simply showing a user how to install a printer code in a program to get their full size printer going, or explaining how a disk drive is hooked up, etc. Those of you who are "more knowledgeable"...we really need your help, if you are willing to take the time to explain something in layman's terms, or solve a problem.

Enough said for the time being on the subject. Before we run out of space, I did want to share with you on what's coming up in TDM.

Our next issue's theme is **TIMEX-SINCLAIR USER GROUPS**. We'll try to provide the most up-to-date listing of groups in the U.S. and Canada that we know of, and also some international groups as well. We will also select the top ten newsletters produced by the TS groups to give all those small time editor's a boost and a pat on the back. Along with the user group information, we will also list any dealer or company that still supports the Timex Sinclair community. And if that wasn't all, the May/June issue will have a complete TDM page index for the past four years of publication (this has been requested a lot!)...plus all of our regular programs, articles and features. Don't miss out (surprises as well!).

Then for the summer issue...July/August...that will be our issue devoted to **STORAGE MEDIUMS**. All about disk drives, program conversions, utilities, some of those "rare" Timex and Sinclair tape drives, and an excellent program by Floyd Chrysler who converted it from a published Spectrum program (with permission from the author) for the TS2068. It really speeds up things for those folks that still use tapes.

Moving on to the next section, I want to introduce you to Ralph Weaver, of Los Angeles, Nevada, who contributed a program called "CH25-17" in the March/April '87 issue of TDM. Ralph is talented in many areas including the graphic arts. The upcoming

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USER GROUP issue is his "brain child", and he has designed a great looking cover for that issue. In addition to that, he will also be doing other art assignments from time to time. After twenty years in the Air Force, Ralph is facing retirement and a change of pace...we wish him the best of luck!

IN THE MAILBOX

An Open Letter To The Readers

Every once in a while, Tim Woods (our Editor and Friend) will stand on a soap box, and declare his loyalty to the Times-Sinclair community of computers. And for the larger percentage, we are right behind him. These little TSU-based computers are great to work with, and to have fun with.

A good number of people, be they common users, on up to the Dealers and the ones who keep us healthy, have stood the ground for our orphan. We putter and tinker around with these black and silver machines, making it work a little harder and a little better.

We have even banded together in small groups, meeting month after month, year after year, just for the simple pleasure of talking to someone who has a common interest--the Sinclair computer.

But I have started to notice a trend. There is a departing mode going on. People are leaving our midst, to "upgrade" to the Big Blue Compatible, and with them goes the little tidbits of invaluable information, and experience. I wish them good fortune, for they have polished their computing "baby-teeth" on our Beloved Brand. But let's hang onto their phone number or address...

For the negative trend is also appearing, there are groups out there that are struggling, suffering from low membership and purpose. Some of us are tucking in our tails, hiding our pride.

Let's just cut off that old TMSI, lean it to someone who doesn't compute. If it's been awhile since you ordered that one little piece of software, or bought a new Disk Drive, or a full size printer or monitor, scrape your pennies together and assault your dealers (they'll love ya for it!). Bring a non-TS-user to your next group meet.

The time has come to start up a "National TSUB Organization". To think of its potential is mind-boggling. A whole continent of ideas, help, and service. Working together for standardization, software and hardware implementation, and even a logo to show our unity.

Think about it, and then take action.

Ralph Hammer

Sec/Treas.

Times-Sinclair Users Group
of San Diego, Nevada

Guest Editorial: The "Sleeping Man Awaken"

If you are a "DUNE" fan (as I am), you may have recognized that the title for this editorial was taken from that book (and movie)! But, that is exactly how I feel...now that I finally broke down and bought a Disk Drive System for my TS2068. That's right, all the program development that I have been doing...desktop Publisher and all, was 100% TAPE based! Thinking back, I shudder at the thought of all the wasted hours doing tape loads/saves and veriflies. How did I ever stand it?

Oh, I know you've heard all this before...I know, I was skeptical too! Why would anyone want to spend so much money on a "dead" computer...how much longer is that little grey box going to work anyway...why not spend the money and get a real computer...all very good questions!! All these (and

How to kick things off for this issue, we have a number of guest editorials, letters, tips, and general mail...so we have elected to let Ralph Hammer go first. As always, we appreciate your comments and any correspondence is welcome. If you haven't filled out your **READER SURVEY** yet, there is still plenty of time (WHY HAVEN'T YOU?!!). Another copy of the survey is provided elsewhere in this issue. We will report on the survey findings next time. See you then!

more) I asked myself for the better part of 4 years now, I guess it took me that long to find the answer: **BECAUSE I WANT TOO!** That is what it all boiled down to. This little grey box is a REAL computer, not a toy! The simply fantastic programs available on it is proof enough for that. My little grey box has been going 20 to 30 hours per week, week after week, for 4 years...and when this one dies, I'll dig out my spare, and when that one goes, I'll have had time to get a second spare...all for a lot less money than one of their "real" computers. And how reliable is Big Blue (or a Clone) anyway?

But what really sold me was the new possibilities available with the disk system. The Aerco Disk Drive System has 64K of extra memory built into the interface, that is expandable. The Larkem RAMdisk provides a second form of added capabilities, and can use the Aerco 64K as a RAMdisk without adding anything to the system. In each case, the **MEMORY BARRIER** is broken!

My new desktop program (Pixel Print Professional) uses the Aerco RAM to BANK-SWITCH a second Pixel Print engine, allowing the user to load and switch between left and right columns in the Desktop Program. The "Print-a-Document" program (part of the same package) uses BANK-SWITCHING to hold and print both left and right columns simultaneously! This provides perfect column alignment in the twin (32 character) columns, and allows real 64 column Desktop Publishing when importing files from TABSOFT or other word processors that create ASCII text files, in the single 64 column format. The LARKEM version will use the RAMdisk to hold file data and provide fast data transfer similar to the Aerco Bank-Switching. Volatile or non-volatile RAM cartridges can provide quick and easy add-on memory for tape and microdrive users too!

As the add-on memory systems become more popular, watch for more and more programs to be written to use these capabilities! Certainly the desktop programs are only one of many new applications that will take advantage of this new break-through!

So, wake up your computer and do what your inner self has been wanting to do for a long time now...send in that disk drive order, you won't regret it!! (For your information, I have compiled a short list of LOAD times for a variety of programs I use regularly. These times are for comparison purposes only...like government MPG figures...but somewhat more accurate!!)

G. D. Lemke
Lemke Software Development
Wichita, Kansas

Typical AERCO DISK vs. CASSETTE load times
(Time in seconds)

Program	AERCO	CASSETTE
Pixel Print v2.2	6-17	93-75
TABSOFT II	7-80	116-75
Go-Print (with printer driver and optional data file)	14-30	200-75
YERKSHIRE	26-35	165-92
Pixel Print Data	4-00	212-95

I was very pleased to receive the JAN/FEB issue of TBM magazine and see your questionnaire on what track you should be taking. For myself, I am interested only in articles concerning T/S equipment from TBM; that is, if I wanted articles about IBM, I would seek out national publications or their user groups which are quite strong as we all know.

As to why I am interested in T/S, I suckered in on the PC8500 as T81000 clone, and through the Dallas Times User Group, changed very quickly to a model T82048. I am a working engineer (1950 vintage) where in my job I have access to and use daily, a nation wide IBM network system operating five 3090 machines with operating systems of M204, VM204, and T801 these are networked via a high capacity data transfer system to our scientific computer center and where we use VAX, CDC, and CRAY mainframes. The present CRAY XMP4 is being replaced in March with an XMP28. These machines will compile a 10,000 line Fortran program in about 1 second. My department software is being moved to the CRAY, and we will use a VAX 6800 as the front end of this system. So for many years I did not want any kind of PC in my home, but after buying a Radio Shack TRS-80 Pocket Computer at a camera fair, and being exposed to BASIC on it...then along came the PC8300. The T/S User Group recommended the T82048, and when a T/S user went to Atari, I wound up with a T82048, T82040 printer, quite a bit of software, and since then I have added quite a few disk drives with the LARSEN operating system, John McMichael's Commodore plotter, and lots of software from the SINCUS News Exchange Program.

Tim, we all wish you well in the magazine, and realize that the orphan will never be a roaring success, but the only reason I subscribe to TBM is the fact that it is a good source of T/S information and I do not have to sift through many unrelated articles. I actually would prefer a magazine devoted to only the T82048, but know this is not practical. I am sure many of the earlier programs for the T81000/T81500/X801 can be utilized fairly readily if you have an interest.

John D. Austin
McKinney, Texas

Puzzle Of The Month Fan

If King Xerxes of the JAN/FEB "Puzzle of the Month" could afford to have over 40 wives, he obviously could afford a computer. (Probably a Zorba.) We have to ask why he needed the last hint to determine the number of animals brought to him.

From Cedric Bastiaans' program, we know there are two possible solutions, one with 46 wives and one with 52 wives. Let's assume the king had 46 wives. I'm sure an old hacker like Xerxes wrote a program similar to Cedric's. There would be one difference. Before he received the last hint, he wouldn't yet know the number of wives was less than half the total (this was the final hint), but he would know that the total of all the animals was equal to 46. To see what the king's earlier programs must have looked like, change one line in Cedric's program. Instead of the AND 0 (W/2) in line 45, use AND W#46. The rest of the program can stay unchanged. Run the program. You'll get exactly one answer. If Xerxes had 46 wives, he would have had the answer without asking for the final clue. So we can assume he didn't have 46 wives, and the solution totalling up to 52 is the only correct one. I hope that Xerxes wasn't a complete computer nerd who spent all his time on his machine. Can you imagine 52 computer widows?

This is a great puzzle because it requires both computer and human analysis. I came across this puzzle at the perfect time...reading TBM on the way to work! That day, my boss didn't show in, so I had all day to work on it. Since I'm not sure if my boss or anyone in his family reads this magazine, I'd better sign off as...

Name Withheld
Upon Request

I have to believe that I am not alone in my resistance to upgrading to a new computer every two years. It is not the cost--I have plenty invested in my X801 systems. I just feel that I could spend the next decade or so exploring all the possibilities of the X801 with various hardware and software improvements available.

The X801 is, I feel, the perfect "base" from which to explore the world of the computer and the Z80 microprocessor. In a recent letter from Fred Macchiusi (Silicon Mountain Computer), Fred sums it up much better than I ever could. Allow me to quote:

"I can't help but wonder, though, if one day the simple computer won't reappear. It seems that the whole computer industry is shooting itself in the foot by coming out with fancier computers at lower and lower prices. Already it's at a point where the best you can hope for with some of the new machines is to become a capable user. Forget about trying to understand it. At least with the X801 one stands a chance of learning what makes it go."

Van S. Vangor
Bethlehem Tool
Island Falls, Maine

Times/Sinclair--"The Real Thing"

I called a man up just the other day,
"I'd like a power supply," I had to say.
"For a disk drive on my 2068."
He replied, "forty dollars."
I said, "Hey, that's GREAT!"

But then he went on to ask, "What could it do?"
I sat back and smiled and said, "How about you?"
"Oh, I started with others,"
He said with dimmy,
"But look around now, where are they today?"
Too small and too slow and not much real use there.
So they sit in my closet, under the stair."

"For just a few bucks you clone an XT?"
(Having used them before) I stated, "Oh, yes."
"Move up to a machine you can DO SOMETHING with,
And you can SAVE all kinds of bucks! IF
You build it yourself, it'll be QUITE a machine.
With CP/M and MS-DOS, you can have a custom dream!"

"My thank you," I said, "I'll keep it in mind,
And give you a call if I can find the time."
But laughing quite loudly as I hung up the phone,
I thought, "I've got the REAL THING, who NEEDS a CLONE!"

Clint Cook
Santee, California

ZEUS UTILITY Revisited

In the MAY/JUNE '87 issue of TBM, we published a short T82040 utility by Richard Hard, that converts ZEUS source code files into an ASCII file for either MSCRIPT and TABWORD 2.0. Evidently, there were some problems with the original listing. Here is the corrected version, including step-by-step instructions.

- 1) LOAD ZEUS (assembler) CODE
- 2) Enter this little BASIC listing

5 REM HERE TO ENTER CODES

```
10 LET T=0
20 FOR P=61421 TO 61624
30 IF T=0 THEN PRINT P;LET T=6
40 INPUT N
60 POKE P,N:PRINT TAB T;N;
40 LET T=T+1:IF T=29 THEN PRINT:LET T=0
70 NEXT P
END TYPE
```



```

110 LET T=0
120 FOR F=61491 TO 61624
130 IF T=0 THEN PRINT F;:LET T=T+6
140 PRINT TAB 7;PEEK F;
150 LET T=T+6:IF T>29 THEN PRINT:LET T=0
160 NEXT F

```

- 3) Now enter the list of 194 bytes of code I've included. SAVE this along with the names list from ZXUS (415 bytes) as "Z_P_M/T" CODE 61615,616
- 4) Just add this code to the BASIC listing from the TDM article and you have it.

ZPM/T

```

61491 39 8 126 17 79 183
61497 35 35 126 254 19 40
61493 41 254 126 40 47 254
61495 0 40 4 10 19 24
61495 230 62 13 10 35 19
61461 126 254 255 32 7 35
61467 126 254 255 40 70 43
61473 62 237 186 32 215 62
61479 255 187 48 59 24 280
61495 35 70 62 32 18 19

```



```

61491 16 252 24 199 203 191
61497 14 0 229 33 67 238
61503 195 40 18 245 35 126
61509 254 0 48 6 254 10
61515 40 2 24 244 241 12
61521 35 24 235 126 10 35
61527 126 19 254 0 40 6
61533 254 10 40 2 24 241
61539 226 24 152 236 17 70
61545 102 167 237 02 220 193
61551 281 176 186 112 126 42
61557 114 240 6 64 62 32
61563 110 35 16 252 42 112
61569 240 1 0 0 126 254
61575 13 40 8 254 255 40
61581 31 12 35 24 243 35
61587 229 237 91 114 240 42
61593 112 240 237 175 42 114
61599 240 1 64 0 9 34
61605 114 240 225 34 112 240
61611 24 199 42 114 240 1
61617 40 117 183 237 66 229
61623 193 201

```

NEWS

SUNSTATE TIMEX SINCLAIR WINTERFEST '88

A lighter attendance than expected and heavy rain didn't dampen the spirits of those T/S users who gathered in Orlando, Florida on March 5 and 6 for the Sunstate T/S Winterfest. A good time was enjoyed by all those who could make it. The area is one of the nation's most popular tourist spots, with EPCOT and Walt Disney World just a short drive away.

The dealer tables drew the most interest, with companies such as Zebra Systems, Sharp's, A+ Computer Response, Foote Software, Syncware News, WDJUP Co., and Time Designs; displayed their merchandise.

There were also some interesting Sinclair "one-of-a-kind" bargains to be found. For instance, A+ had boxes of items that were retrieved from the old Sinclair warehouse in Boston, when it shut down operations a few years ago. They offered packs of ZX81 ROMs, 2K RAMs, ZX80 kits which were in the original packaging, and the unique Sinclair FM Radio Watches...which were quickly snatched up.

Another interesting display was put on by Mr. Eric Johnson, of Orange City, Florida, who obtained a large stock of surplus Timex Sinclair items from a relative who works for Timex in Connecticut. Among the most notable were a series of TS1500 circuit boards that had been issued by Timex, from an early prototype board, to a later compact design from Portugal. There was also a good quantity of TS2068's for sale.


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*o/s*      Converts astronomical coordinates to altitude/azimuth (in TUN M/D '85)
*o/s*      Ultra-easy designer graphics for redesign of U.P.G.s (in TUN J/A/86)
*o/s*      "ids" version 2 allows multiple fonts and such more (in TUN M/D '86)
*o/s*      BASIC full-screen window facility - restores screen (in SMS M/D '86)
*o/s*      BASIC Classy Front End new fonts utility (as appeared in TUN M/A/87)
*o/s*      Complete Classy Front End fonts M.C. version (as in TUN J/A-M/D '87)
FLSH this addition if you wish:

```

```

"win" Windows & Portholes complete - can work with "cfe/mc" (see this issue)
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```

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TDK CASSETTE 5-PACK.....4.99 each

(If ordering with other software these will be shipped free, otherwise please add \$2 per Pak postage and handling)

(continued from page 7)

The Larkien 250K RAMdisk for the TS2068 was unveiled for the first time in public. The small compact Board features on-quarter Meg of non-volatile RAM, and when used with the Larkien LKIOS cartridge, it operates with standard cassette type LOAB and SAVE commands.

Along with the dealer tables, there were tables with catalogs and brochures from some absentee vendors, and a few user groups, including the Northeast Florida T/S Users Group (Jacksonville), the TASBAM group (St Petersburg and Tampa), the CATS group (from Washington, DC), and the SNUG group (from Wisconsin), had tables as well.

On Saturday evening, a meeting was held to discuss the idea of a National Times Sinclair user group. Some proposals were presented and comments were solicited from the audience. Overall, it was the consensus that such an organization would help unify and strengthen our TS community, and benefits such as a central Public Domain software library would be offered. (Note: read the accompanying article on the national group for further details).

A National Sinclair Organization

N.U.U.S. (Sinclair Northamerica Users Group) is an idea spawned by the organizers of the Sunstate T/S Winterfest, and has evolved from suggestions and comments from other Times/Sinclair users.

The intent of SNUG is to provide a forum for exchange of ideas. It would be a source of information, such as a listing of active members, active user groups, Sinclair-specific BBS's, an active library of Public Domain software, and a listing of available shareware and freeware. Later on, proposed industry standards for hardware and software would be adopted. So as to not have to "reinvent the wheel", an already established national group would be used as a model to base the group on (such as CORSA—the Corvair Owners Assn.). SNUG would act as an umbrella organization, with regions being developed to tie in with established user groups in those areas.

It is not the intent of the SNUG organizers to infringe on, or supersede any already established group or company. It is only intended to show some strength to the industry that Sinclair is not dead, and the mere fact that an organization can be formed, will show unity and interest in Sinclair computers. Even a North American 'Calendar of Events' could be established to help co-ordinate future plans and events.

SNUG needs the support of every single Sinclair user in the U.S., Canada, Mexico (or for that matter—anywhere). If you have any comments, questions, ideas, etc., contact either Mel Nathanson, 7918 Arborfield Drive, Port Richey, FL 34668, (813) 863-3532; or Mary-Lynn Johnson, 190 Hickory Woods Ct., Unit 3-C, Belton, FL 32223, (305) 860-2465. The organizers of SNUG are putting a time limit of June 30, 1988 on their idea. If there is no response or support of the idea, then they will not proceed further. If there is input, an update will appear here in TEM.

SUMMER WESTCOAST TS FAIR FEATURES AN "ALL-STAR" CAST

The "perfect" summer vacation destination for any Sinclair fan is the emphasis for the Third Annual Intercontinental Northwest TS Mini-Fair. What was once a regional affair (held last year in Seattle), has expanded into a two-day event.

The show will be held on Saturday and Sunday, August 6 and 7, at the Cosmopolitan Hotel in Portland, Oregon. It is hosted by the CGAT/S User Group of Oregon, along with three other northwest Times Sinclair groups, and is co-sponsored by RWS Enterprises and Time Designs Magazine.

Many of the exhibitors and guest speakers are already committed. To date, Zebra Systems (from New York), Sharp's Inc. (from Virginia), Ed Grey Enterprises (from California), American Micro-Connection (from California), Jack Bohany (from California), RWS Enterprises (from Oregon) and Time Designs (from Oregon), are signed up to participate as dealers. Confirmed guest speakers include Jack Bohany (author of many software enhancements for the TS2068), Mike de Bossa (author of "Taking The Quantum Leap"), Ed Grey (telecommunications expert), Syd Wyndrop (TS2068 software developer and TEM columnist on 280 Machine Code), Michael Carver (programmer and TEM columnist), Vince Lyon (author of "Archive Master"), and Norm Leifeld (QL programmer). Tentative at press time: Fred MacBauer (Silicon Mountain Computers), Stan Leake (Pixel Print), Bob Orffelt (EPROM enhancements for the TS2068), Bill Righer (ZX81 expert), and representatives from Cambridge Computer (Z80).

User groups from California, Oregon, Washington, Nevada, British Columbia (Canada), and Wisconsin, are scheduled to participate.

On Saturday night (August 6) at 9:00pm, a Round Table Sinclair Forum will be held. This informal get-together will include a panel of noted Sinclair "experts", which will field questions from the audience. This will likely be the high point of the weekend.

One feature of the show will cater to the non-computer spouses and family members. For the kids, a professional clown will entertain, and for older folks (and the kids), inexpensive guided bus tours will depart daily to explore attractions of the northwest (which include the Columbia River Gorge, Portland Zoo, Oregon Museum of Science and Industry, and views of Mount St Helens).

Another feature of the show, will be to invite the general public to come experience "hands on" demonstration of Sinclair computers. This is to combat the "fear" that some people still harbor towards personal computers.

Quality accommodations at the on-site hotel are very reasonably priced. Double occupancy for only \$38 (plus tax). The hotel has a coffee shop on the ground floor, and a restaurant/lounge on the top floor—with views of the city lights at night and entertainment. The Cosmopolitan Hotel (1630 N.E. Union) is located just off of Interstate 5, and is close to bus lines, city transportation, and just a short trip from the airport. Hotel phone number is (503) 235-8433, and mention the "Times Sinclair Mini-Fair" to the reservationist.

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Start making your vacation plans to participate in this Time Sinclair happening. For further information, contact the show producer, Rod Gowen, by writing to- 1419 1/2 7th Street, Oregon City, Oregon 97045; or call- (503) 455-7404. If you send a large self-addressed envelope with two 25 cent (first class) stamps, Rod will send you a complete packet of information including registrations forms, and brochures of area tourist attractions. A \$35 is also online in the evening and morning hours (PST) for information. Phone number: (503) 455-8072. Moscow setting: 8/1/None.

HIGHEST REGIONAL TS CONFERENCE

Another Sinclair gathering is planned for August 24 and 25, in Cleveland, Ohio, at the Beck Center for the Arts. The Greater Cleveland Sinclair Users Group is the host, and they are looking for other guests, guest speakers and vendors to participate. The theme of the event will be "users - learning from other users".

Inquiries about the regional conference can be directed to: Andy Koslarski, 2192 Glenbury Ave., Lakewood, Ohio 44107, ComputerSource ID# 75046,3420. Or try the Timesline BBS: phone (216) 471-6922, settings: 8/1/None.

EVER HEAR OF THE T/S 3068? (AND OTHER MATTERS)

At a recent meeting of the LIST (Long Island Sinclair Timex) users group, the former head of the Research and Development department of the Timex Computer Corporation, Billy Skyrme, attended and gave a talk. Mr. Skyrme is currently the president of PSION, Inc., the manufacturer of the Organizer pocket computer.

While, Mr. Skyrme admitted that he still was under contractual agreement with Timex, and that certain information couldn't be discussed, he did mention some items that turned many members of LIST green.

The TS2048, related Skyrme, was to have been either a "cleaned-up" 48K Spectrum, or a totally re-engineered design. While a clean Spectrum was submitted for FCC approval, the later model was selected for manufacture.

Another computer was in the works, called the T/S 3068. It would have featured 1 Megabyte RAM, Virtual Memory, 256 colors and high-res graphics. "The only machine...that would be in its class today is the Amiga", stated Skyrme. The T/S 3068 would have retailed for \$1999.95.

Another interesting fact, was that the "BEU" (Bus Expansion Unit) for the TS2048, as seen in the photo published by TIME MAGAZINE issue July/August '86, page 23) was, according to Skyrme, completely engineered and ready for to be production. With an internal floppy disk interface built in, Timex would have sold external 3.5" drives in little silver boxes for as little as \$49.95. This plan was far enough along that Timex had a supplier lined out for the drives.

Most of the information on proposed products for the TS2048 (and the TS3068) will never be made public due in a myriad of legal reasons, and the engineers involved in the project have all gone their separate ways.

Mr. Skyrme also demonstrated the Organizer and accessories to the LIST group. This hand held computer (upgradable to 256K RAM), has sold well in markets where recording and calculation of numbers in the field, and other simple "type-in" answers are required.

The LIST group can be contacted by writing c/o Harvey Rait, 5 Peri Lane, Valley Stream, NY 11581. The above information was supplied by member, Joe Newman.

TEN COLUMNIST MAKES "BIG TIME"

Duncan Teague, a regular contributor to TIME MAGAZINE and other Sinclair publications, is now a regular contributor to COMPUTE! Magazine.

Duncan's connection to COMPUTE! began when a whole chapter on a book called "USING NEWSROOM" by Gregg Keizer (and published by the COMPUTE! Library Selection division of the magazine) was devoted to him. The newsletter was published by Duncan and some students. Mr. Teague is the current director of the Crainmont Planetarium in Memphis, Tennessee, which is financed and operated by the Memphis City School District and is also a professional astronomer. The "in-house" publication is called "SKYWATCHER" and is produced with NEWSROOM, a Macintosh computer, and a laser printer.

NEWSROOM is a desktop publishing program which is available for many different types of PC computers (except the Sinclair...but then we have PIXEL PRINT!). It was one of the early entries into this growing market, which has bred even more powerful programs.

Through the book, Duncan met the editor of COMPUTE!, and was asked to do software reviews of commercial Apple and Macintosh programs. His writings appear in the most current issues.

Rest assured, Duncan has not forsaken his Sinclair equipment, which he still uses at home (a TS2048 and Aerco disk drive system, and other equipment). In fact, most recently, he has taken over the publishing and editing of his church's newsletter, and uses Lemke's PIXEL PRINT desktop publisher for the task. (For an article on TS2048 Desktop Publishing by Duncan Teague see the Sep/Oct '87 issue of TSD). Watch for further information and tips from our resident desktop expert.

SOME OF THE BEST PROGRAMMING AROUND

If you really want your Timex Sinclair 2048 to work for you like it was originally intended to do, then you need to take a look at some of the very excellent programs written by Eric and Kris Boisvert of BYTE POWER.

To date, they have put together ten "issues" of their electronic magazine on cassette, which add up to over 100 programs for the 2048! (Byte Power Magazine is also Spectrum compatible).

In the most current issue, the cassette contains nine programs, plus documentation in a text file. "CONFLICT" has some of the best screens we've seen, perhaps even rivaled by the fine commercial Spectrum programs. There are four other games, plus a lotto number selection program, a music utility, and a boot utility for the Larken LK005 cartridge.

If you have never seen what this brilliant software team has cooked up for the TS2048, then you need to send for a sample issue of Byte Power for only \$5.50. Write to: 1748 Meadowview Ave., Pickering, Ontario, Canada L1V-3P8. Now there is no reason for anyone to complain about the lack of good T/S software...there's plenty of it available from Byte Power!

TWO NAMES CHANGE - SERVICE REMAINS THE SAME

ED GREY ENTERPRISES (formerly Gray & Clifford Computer Products) continues to support the Timex Sinclair market. A new BBS called the "Grey Matter BBS" is now online (213-771-6240, settings: 8/1/None, supports 300/1200 baud). A FREE catalog of Timex specific products and non-specific computer items is available by writing to: PO Box 2186, Inglewood, CA 90305, or calling (213) 759-7406, and also requests can be accommodated on the BBS.

Assembled and tested versions of the popular 2-81/0 RS232C Serial Card, are no longer available. However, a new BARE BOARD PACKAGE is now available for the TS2048 computer with complete documentation, for only \$24.50 + \$2.50 S&H. Write to Ed Grey for details.

Another TS dealer, Variety Sales, has changed their name to VARIETY COMPUTERS & ELECTRONICS. You can write for their free catalog at: 325 W. Jersey St., Suite 2-2, Elizabeth, NJ 07202.

FROM THE RUNNER HILL

Fred Nachbaur, of Silicon Mountain Computers, is reportedly developing a Timex Sinclair clone of his own, which will incorporate many improvements and enhancements. No further details are available at this time.

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SOFTWARE TS2068 TS1000

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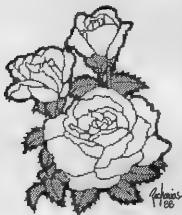
ART GALLERY



Artwork by William McBride, of Salisbury, North Carolina, using his own art program called DRAW 512.



"Teddy Bear" by Carl Green, East Liverpool, Ohio, using ARTWORX (Novelsoft).



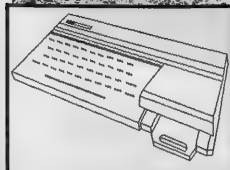
"Roses" by Dennis Zacharias, of Yukon, Oklahoma, using ARTWORX (Novelsoft) and TECHDRAW (Zebra).



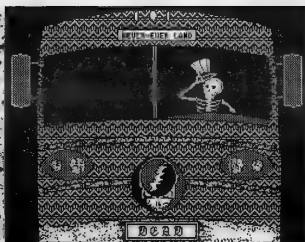
"House and Car" artwork by Arthur S. Margano, Philadelphia, PA, using TECH DRAW JR (Zebra).



"Needlecraft Pattern" by Dennis Clinton of Sanland, California, using PABLO PIXEL-D (by Michael Carver-published in The Best Of TDM Vol.1).



"Times 2048" by William McBrine, of Salisbury, North Carolina, using his own art program called DRAW 512.



"On The Bus" (C) Copyright 1987 by Michael E. Carver, of Portland, Oregon, using THE ARTIST (DotTechnics--for the Spectral).



"Garfield" by Dennis Zacharias, of Yukon, Oklahoma, using ARTWORX (Novelsoft) and TECHDRAW (Zebra).
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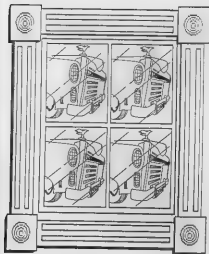
ZX-CALC/AM



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CLASSY

FRONT END

by Paul Bingham

WINDOWS

It is time to begin the next phase of CLASSY FRONT END: Windowing. Now I have cooked up two kinds of windows for CLASSY. One is the rectangular kind with shadows down two sides, and the other is a small set of round windows for quick footnotes, status reports, and the like. These round versions of post-it-notes I call PORTHOLES.

Now as usual the total program is much too long to finish up in one issue of TZM, in fact we'll be real lucky to finish it all next time. I also like to leave readers with something they can run and use each issue. So CLASSY windows has been divided up into some useful, stand-alone routines, some of which we will explore this time. If you type in the listings, try to follow the line numbering as they appear. Later, when we "put it all together" merging these smaller programs to form a big one will be a breeze. The "Windows & Portholes" program we will end up with, will be a complete machine code windowing program which can work by itself or with the CLASSY FRONT END fonts 2 thru 5) we finished up last time.

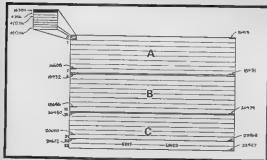


Figure 1: 2048 Display File Map

Lets start our discussion on 2048 windows by discovering that the 2048 treats the standard screen as three windows already! What? That's right, Uncle Clive's little wonder addresses the screen in the display file as three separate sections. I've mapped these in Figure 1 as A,B,C (the last two lines of C being the edit lines). Now if your having trouble visualizing this, let's experiment for a moment. Type in a line like: 10 FOR t = 16384 TO 22527 : POKE t, 255 : NEXT t. Now RUN it and watch the display carefully. The program is directly poking the code for eight black pixels (255) into each consecutive address of the display file. Notice that it fills all of the window A before starting window B and so on. In the old Z801, the display file was much simpler. With the 2048 we will have to work around these set windows to produce our own custom slices.

Fortunately the 2048 display file does have a system which a little code can work with to produce whatever we might want. Each byte holds the information of eight bits, each of which produces a pixel. If all of the bits are set (i.e., equal 1), like our code 255, then all the pixels are blackened in. Each of the screen bytes along one row are also consecutive in memory. Notice on our map that the first byte is address 16384 and as we progress along the 32 COLUMNS across the last in the row is 16415 (or 16384 plus 32). At the beginning of the next ROW (at address 16416) the next byte appears eight pixel elements below the previous row. This is because each screen character is eight pixels high as well as eight pixels wide. Looking at the exploded view of a screen character with our map you will see this. Each row of pixels in a character is stored at an address 256 bytes greater than the last.

Now to make sense of all of this type in Listing 1 entitled "screen address finder". The code in DATA lines 1600 to 1630 and disassembled in Figure A takes the two coordinates of a character location like we use in a PRINT AT statement and figures out the address of the top byte of that position in the display file. This is very important to us because we will need such information if we want to draw windows and also hope to restore any original stuff to the screen when we erase the window. Listing 1 randomly chooses some PRINT coordinates in the BASIC font in

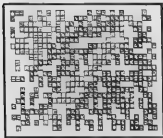
```

1 REM screen address finder
5 CLEAR 50000
10 FOR i=50000 TO 50061
20 READ c:POKE i,c:DATA 213,
30 17,0,33,15,235,229
40 DATA 1,1,33,240,225,203,10
50 2,4,33,240,225,224,53,1
60 3,6,33,240,225,224,53,1
70 4,8,33,240,225,224,53,1
80 5,10,33,240,225,224,53,1
90 6,12,33,240,225,224,53,1
100 7,14,33,240,225,224,53,1
110 8,16,33,240,225,224,53,1
120 9,18,33,240,225,224,53,1
130 10,20,33,240,225,224,53,1
140 11,22,33,240,225,224,53,1
150 12,24,33,240,225,224,53,1
1600 DATA 207,33,176,92,225,209,
1700 1300 NEXT i
1800 LET x=RND*31 LET y=RND*21
1900 LET x=50000+x:POKE 50004,y
2000 LET x=50000+x:POKE 50004,y
2100 LET x=50000+x:POKE 50004,y
2200 LET x=50000+x:POKE 50004,y
2300 POKE x,255 POKE x+7,255:25
2400 FOR i=1 TO 6:POKE x+i,250:25
2500 NEXT i
2600 PRINT OVER 1:AT y,x,CNR$ (x
2700 +y+33)
2800 GO TO 1710

```

Listing 1

screen addr CK TYPE report			
1	70	9847	
2	13	1595	
3	27	2000	
4	52	2615	
5	78	3048	
6	104	3515	
7	130	3983	
8	156	4450	
9	182	4917	
10	208	5384	
11	234	5851	
12	260	6318	
13	286	6785	
14	312	7252	
15	338	7719	
16	364	8186	
17	390	8653	
18	416	9120	
19	442	9587	
20	468	10054	



Listing 1: Display

lines 1710 through 1770 and then calls the code to get an address. Line 1740 pulls this info out of a little spare RAM address the code uses as a safe place to tuck such things. Line 1750 then 'draws' a box around the periphery of this character square. By rewriting lines 1710 through 1770, one could exploit this facility in many ways.

Listing 2 is the real performer this time. It will use the code of DATA lines 1400 through 1450 to draw four portholes as shown. Again the BASIC lines 1510 through 1560 could be written to draw the porthole(s) anywhere on the screen. If you study this code's disassembly in Figure 9, you will find it uses the ROM's CIRCLE and DRAW routines found at 98A2 (248A h) and 99A5 (24E3 h). By setting register A equal to the parameters we want and calling the ROM's integer stacking routine at 1251B (30A5E h) we circumvent the hassles of floating point.



Listing 2: Display

```

1  REM porthole demo
2  CLEAR 57000 PRINT AT 0,0
3  GOTO 10000
4  REM 10000 TO 25100
5  REM 25100 TO 30100
6  REM 30100 TO 35100
7  REM 35100 TO 40100
8  REM 40100 TO 45100
9  REM 45100 TO 50100
10 REM 50100 TO 55100
11 REM 55100 TO 60100
12 REM 60100 TO 65100
13 REM 65100 TO 70100
14 REM 70100 TO 75100
15 REM 75100 TO 80100
16 REM 80100 TO 85100
17 REM 85100 TO 90100
18 REM 90100 TO 95100
19 REM 95100 TO 100100
20 REM 100100 TO 105100
21 REM 105100 TO 110100
22 REM 110100 TO 115100
23 REM 115100 TO 120100
24 REM 120100 TO 125100
25 REM 125100 TO 130100
26 REM 130100 TO 135100
27 REM 135100 TO 140100
28 REM 140100 TO 145100
29 REM 145100 TO 150100
30 REM 150100 TO 155100
31 REM 155100 TO 160100
32 REM 160100 TO 165100
33 REM 165100 TO 170100
34 REM 170100 TO 175100
35 REM 175100 TO 180100
36 REM 180100 TO 185100
37 REM 185100 TO 190100
38 REM 190100 TO 195100
39 REM 195100 TO 200100
40 REM 200100 TO 205100
41 REM 205100 TO 210100
42 REM 210100 TO 215100
43 REM 215100 TO 220100
44 REM 220100 TO 225100
45 REM 225100 TO 230100
46 REM 230100 TO 235100
47 REM 235100 TO 240100
48 REM 240100 TO 245100
49 REM 245100 TO 250100
50 REM 250100 TO 255100
51 REM 255100 TO 260100
52 REM 260100 TO 265100
53 REM 265100 TO 270100
54 REM 270100 TO 275100
55 REM 275100 TO 280100
56 REM 280100 TO 285100
57 REM 285100 TO 290100
58 REM 290100 TO 295100
59 REM 295100 TO 300100
60 REM 300100 TO 305100
61 REM 305100 TO 310100
62 REM 310100 TO 315100
63 REM 315100 TO 320100
64 REM 320100 TO 325100
65 REM 325100 TO 330100
66 REM 330100 TO 335100
67 REM 335100 TO 340100
68 REM 340100 TO 345100
69 REM 345100 TO 350100
70 REM 350100 TO 355100
71 REM 355100 TO 360100
72 REM 360100 TO 365100
73 REM 365100 TO 370100
74 REM 370100 TO 375100
75 REM 375100 TO 380100
76 REM 380100 TO 385100
77 REM 385100 TO 390100
78 REM 390100 TO 395100
79 REM 395100 TO 400100
80 REM 400100 TO 405100
81 REM 405100 TO 410100
82 REM 410100 TO 415100
83 REM 415100 TO 420100
84 REM 420100 TO 425100
85 REM 425100 TO 430100
86 REM 430100 TO 435100
87 REM 435100 TO 440100
88 REM 440100 TO 445100
89 REM 445100 TO 450100
90 REM 450100 TO 455100
91 REM 455100 TO 460100
92 REM 460100 TO 465100
93 REM 465100 TO 470100
94 REM 470100 TO 475100
95 REM 475100 TO 480100
96 REM 480100 TO 485100
97 REM 485100 TO 490100
98 REM 490100 TO 495100
99 REM 495100 TO 500100
100 REM 500100 TO 505100
101 REM 505100 TO 510100
102 REM 510100 TO 515100
103 REM 515100 TO 520100
104 REM 520100 TO 525100
105 REM 525100 TO 530100
106 REM 530100 TO 535100
107 REM 535100 TO 540100
108 REM 540100 TO 545100
109 REM 545100 TO 550100
110 REM 550100 TO 555100
111 REM 555100 TO 560100
112 REM 560100 TO 565100
113 REM 565100 TO 570100
114 REM 570100 TO 575100
115 REM 575100 TO 580100
116 REM 580100 TO 585100
117 REM 585100 TO 590100
118 REM 590100 TO 595100
119 REM 595100 TO 600100
120 REM 600100 TO 605100
121 REM 605100 TO 610100
122 REM 610100 TO 615100
123 REM 615100 TO 620100
124 REM 620100 TO 625100
125 REM 625100 TO 630100
126 REM 630100 TO 635100
127 REM 635100 TO 640100
128 REM 640100 TO 645100
129 REM 645100 TO 650100
130 REM 650100 TO 655100
131 REM 655100 TO 660100
132 REM 660100 TO 665100
133 REM 665100 TO 670100
134 REM 670100 TO 675100
135 REM 675100 TO 680100
136 REM 680100 TO 685100
137 REM 685100 TO 690100
138 REM 690100 TO 695100
139 REM 695100 TO 700100
140 REM 700100 TO 705100
141 REM 705100 TO 710100
142 REM 710100 TO 715100
143 REM 715100 TO 720100
144 REM 720100 TO 725100
145 REM 725100 TO 730100
146 REM 730100 TO 735100
147 REM 735100 TO 740100
148 REM 740100 TO 745100
149 REM 745100 TO 750100
150 REM 750100 TO 755100
151 REM 755100 TO 760100
152 REM 760100 TO 765100
153 REM 765100 TO 770100
154 REM 770100 TO 775100
155 REM 775100 TO 780100
156 REM 780100 TO 785100
157 REM 785100 TO 790100
158 REM 790100 TO 795100
159 REM 795100 TO 800100
160 REM 800100 TO 805100
161 REM 805100 TO 810100
162 REM 810100 TO 815100
163 REM 815100 TO 820100
164 REM 820100 TO 825100
165 REM 825100 TO 830100
166 REM 830100 TO 835100
167 REM 835100 TO 840100
168 REM 840100 TO 845100
169 REM 845100 TO 850100
170 REM 850100 TO 855100
171 REM 855100 TO 860100
172 REM 860100 TO 865100
173 REM 865100 TO 870100
174 REM 870100 TO 875100
175 REM 875100 TO 880100

```

1000	1000	0000	0000	0000	0000	0000	0000
1001	1001	0000	0000	0000	0000	0000	0000
1002	1002	0000	0000	0000	0000	0000	0000
1003	1003	0000	0000	0000	0000	0000	0000
1004	1004	0000	0000	0000	0000	0000	0000
1005	1005	0000	0000	0000	0000	0000	0000
1006	1006	0000	0000	0000	0000	0000	0000
1007	1007	0000	0000	0000	0000	0000	0000
1008	1008	0000	0000	0000	0000	0000	0000
1009	1009	0000	0000	0000	0000	0000	0000
1010	1010	0000	0000	0000	0000	0000	0000
1011	1011	0000	0000	0000	0000	0000	0000
1012	1012	0000	0000	0000	0000	0000	0000
1013	1013	0000	0000	0000	0000	0000	0000
1014	1014	0000	0000	0000	0000	0000	0000
1015	1015	0000	0000	0000	0000	0000	0000
1016	1016	0000	0000	0000	0000	0000	0000
1017	1017	0000	0000	0000	0000	0000	0000
1018	1018	0000	0000	0000	0000	0000	0000
1019	1019	0000	0000	0000	0000	0000	0000
1020	1020	0000	0000	0000	0000	0000	0000
1021	1021	0000	0000	0000	0000	0000	0000
1022	1022	0000	0000	0000	0000	0000	0000
1023	1023	0000	0000	0000	0000	0000	0000
1024	1024	0000	0000	0000	0000	0000	0000
1025	1025	0000	0000	0000	0000	0000	0000
1026	1026	0000	0000	0000	0000	0000	0000
1027	1027	0000	0000	0000	0000	0000	0000
1028	1028	0000	0000	0000	0000	0000	0000
1029	1029	0000	0000	0000	0000	0000	0000
1030	1030	0000	0000	0000	0000	0000	0000
1031	1031	0000	0000	0000	0000	0000	0000
1032	1032	0000	0000	0000	0000	0000	0000
1033	1033	0000	0000	0000	0000	0000	0000
1034	1034	0000	0000	0000	0000	0000	0000
1035	1035	0000	0000	0000	0000	0000	0000
1036	1036	0000	0000	0000	0000	0000	0000
1037	1037	0000	0000	0000	0000	0000	0000
1038	1038	0000	0000	0000	0000	0000	0000
1039	1039	0000	0000	0000	0000	0000	0000
1040	1040	0000	0000	0000	0000	0000	0000
1041	1041	0000	0000	0000	0000	0000	0000
1042	1042	0000	0000	0000	0000	0000	0000
1043	1043	0000	0000	0000	0000	0000	0000
1044	1044	0000	0000	0000	0000	0000	0000
1045	1045	0000	0000	0000	0000	0000	0000
1046	1046	0000	0000	0000	0000	0000	0000
1047	1047	0000	0000	0000	0000	0000	0000
1048	1048	0000	0000	0000	0000	0000	0000
1049	1049	0000	0000	0000	0000	0000	0000
1050	1050	0000	0000	0000	0000	0000	0000
1051	1051	0000	0000	0000	0000	0000	0000
1052	1052	0000	0000	0000	0000	0000	0000
1053	1053	0000	0000	0000	0000	0000	0000
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1055	1055	0000	0000	0000	0000	0000	0000
1056	1056	0000	0000	0000	0000	0000	0000
1057	1057	0000	0000	0000	0000	0000	0000
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1061	1061	0000	0000	0000	0000	0000	0000
1062	1062	0000	0000	0000	0000	0000	0000
1063	1063	0000	0000	0000	0000	0000	0000
1064	1064	0000	0000	0000	0000	0000	0000
1065	1065	0000	0000	0000	0000	0000	0000
1066	1066	0000	0000	0000	0000	0000	0000
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1068	1068	0000	0000	0000	0000	0000	0000
1069	1069	0000	0000	0000	0000	0000	0000
1070	1070	0000	0000	0000	0000	0000	0000
1071	1071	0000	0000	0000	0000	0000	0000
1072	1072	0000	0000	0000	0000	0000	0000
1073	1073	0000	0000	0000	0000	0000	0000
1074	1074	0000	0000	0000	0000	0000	0000
1075	1075	0000	0000	0000	0000	0000	0000
1076	1076	0000	0000	0000	0000	0000	0000
1077	1077	0000	0000	0000	0000	0000	0000
1078	1078	0000	0000	0000	0000	0000	0000
1079	1079	0000	0000	0000	0000	0000	0000
1080	1080	0000	0000	0000	0000	0000	0000
1081	1081	0000	0000	0000	0000	0000	0000
1082	1082	0000	0000	0000	0000	0000	0000
1083	1083	0000	0000	0000	0000	0000	0000
1084	1084	0000	0000	0000	0000	0000	0000
1085	1085	0000	0000	0000	0000	0000	0000
1086	1086	0000	0000	0000	0000	0000	0000
1087	1087	0000	0000	0000	0000	0000	0000
1088	1088	0000	0000	0000	0000	0000	0000
1089	1089	0000	0000	0000	0000	0000	0000
1090	1090	0000	0000	0000	0000	0000	0000
1091	1091	0000	0000	0000	0000	0000	0000
1092	1092	0000	0000	0000	0000	0000	0000
1093	1093	0000	0000	0000	0000	0000	0000
1094	1094	0000	0000	0000	0000	0000	0000
1095	1095	0000	0000	0000	0000	0000	0000
1096	1096	0000	0000	0000	0000	0000	0000
1097	1097	0000	0000	0000	0000	0000	0000
1098	1098	0000	0000	0000	0000	0000	0000
1099	1099	0000	0000	0000	0000	0000	0000

Listing 3

1st 253 bytes CK Type report			
1000	1000	0755	
1010	1010	11221	
1020	1020	18767	
1030	1030	18133	
1040	1040	10599	
1050	1050	18538	
1060	1060	0573	
1070	1070	0932	
1080	1080	2937	

Next time we will examine rectangular windows and restoring things back to the screen. In the mean time, if you feel like getting a head start on code entry, type in Listing 3. We'll be adding to it next time, so you'll need it eventually. If typing is too big a chore, I will send you a complete version of Windows & Portables as advertised elsewhere in this magazine. Windows & Portables comes with BINGHAM'S BEST for \$12.95, or in a collection I call JAZZFIRE (that's right) in a shell for \$9.95. For BINGHAM'S Best owners I will send you Windows & Portables on cassette for \$3. Please write if you have any questions or comments to Paul Bingham, PO Box 2034, Mesa, AZ 85214.

COMMENTS ON CK TYPE by Paul Bingham

Stan Lewis wrote a great little 2048 program which appeared in the May/June '82 issue of TDM called CK TYPE. CK TYPE gives you a quick check of the listings you have typed in from TDM to see if you have made any errors. But so far, I've only seen Stan using it! Well, I intend to report on this cleverness on my part by including CK TYPE reports with each listing. This will help all the readers who type in my programs nip their entry problems in the bud.

I've also taken the liberty to condense Stan's BASIC version into a "one-liner". With a few tricks his whole program fit into one line (999) and this can be easily MEMOED to a listing and RUN to give an evaluation. This "one line" version appears in Listing 1.1. To do this self check, you will have to enter and run it as line 999 not 9999. It has an added facility to tip its own line 9999 in its evaluation. It also starts wanting you to enter the name of the program you are analyzing so it can properly title the output. I hope Stan won't mind me refining his little gem! And come on programmers, let's start using it!

SHORT VERSION CK TYPE REPORT

999 310 20430

Figure 1.1

Reader Survey

There is still time to send in your survey if you haven't already. We need your input to help plan future issues of TDM and to supply our advertisers with important data on service and products. Send this form or a copy to: Reader Survey, c/o TDM, 29722 N. 11th Rd., Colton, Oregon 97017.

ABOUT YOU

Name (optional): _____

Address (optional): _____

Age: _____ Male/Female: _____

Occupation: _____

What is your hobby: Auto Tuning Radio

ABOUT YOUR EQUIPMENTS

Computer you use the most: IBM

Other computers you own: _____

What printer(s) do you own: 2

What medium do you use to store data? T

What monitor(s) do you use: TV

Other equipment you own: 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099

Software package you use most: IBM

Other software you use: F

What computer/hardware item are you planning on purchasing this year: _____

What software package are you planning on purchasing this year: _____

What hardware would you like to see developed for your computer: _____

What software would you like to see developed for your computer: _____

What one comment would you like to make about TS dealers and vendors about service, advice, a gripe, a compliment, etc.: _____

ABOUT TIME DESIGNS

Most favorite section: 1

Least favorite section: _____

One particular article/program you really liked in a recent issue: 1

If you could make one comment directly to the editor, what would it be? 1

Article/program you would like to see in an upcoming issue: 1

Suggestion of a topic for a "theme issue": _____

Do you know of any TS users who don't receive TDM? Would you be willing to supply their names and addresses? Do you have a suggestion on how we could gain more subscribers? _____

```

9999 INPUT $; PRINT $; 'CK TYPE
PE REPORT; LET $=40; LET $=
20430; LET $=PEEK ($-31)
FOR $=1 TO 942; LET $=0; LET
$=PEEK ($+1); IF $=9999
THEN LET $=PEEK ($+3)+PEEK ($
+2); LET $=4; LET $=1; FOR $=1
TO 3; LET $=PEEK ($+3)+PEEK
($+2); LET $=4; NEXT $; FOR
$=2 TO 3; PRINT $; TAB 5; FOR
$=1 TO 10; $=NEXT $; NEXT $

```

Listing 1.1

T52068 DROP DOWN MENUS

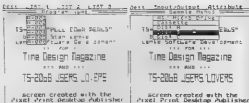
Stan Lemke

One of the advantages the newer, bigger computers like the ATARI ST and AMIGA have over the T52068 class of computers is the "User Interface" that their bigger memory and high speed affords them...specifically, such things as a mouse to sweep a cursor around the screen, and a really nice menu structure that "drops down" onto the screen when your cursor touches the menu line, and then magically disappears when you make your selection. This allows your screen to be free of most of the menu until you need it. Even then, by planning your menu layout correctly, you can show just the lines the user wants for a specific operation and be able to describe the selections more fully than with the usual short word (at most), or a single letter as is more often the case.

Well, with all these advantages to "drop-down" menus, I decided to see what I could do as far as creating a T52068 drop-down menu utility. The following program is just that, a general drop-down menu utility that will allow others to create (very easily) the type of menu found on the more expensive computers. It is also a neat little demo program that allows those who have not seen these menus in operation to get a feel of what they are like.

The utility displays 2 lines at the top of the screen, the first has a list of menu (header) topics, the second displays the program title/name. Using the LEFT joystick, the user moves a small arrow UDO sprite around on the screen. When the arrow cursor is placed on any of the menu headers, a set of menu options drops down onto the screen below that menu header. As the cursor is moved over the options, each turns TRUE/DISE, and then TRUE/VIDED when the cursor moves off that option. Pressing the fire button activates the selection. Moving the cursor off of the menu options (and pressing FIRE) removes the menu list, and replaces the original screen.

The menu headers and options are defined in DATA statements, in lines 9005 thru 9025. In the demo, when the DESK option is selected, a Copyright message about the program is displayed (see line 9440). This Copyright message can be user-defined...up to 3 lines and 23 characters per line. 3 more menu headers can be placed on the top line. Note! You must be careful designing these headers, as the program places two spaces between the header strings. One of these may be a "null string" (empty, two apostrophes placed side-by-side, indicating no more headers).



Menu selection are defined using DATA statements in lines 9005, 9020, and 9025. Six selections are available for each header, with the option of using null (empty) strings as above, to indicate no more selections.

Let's take a look at the program listing. The program is set up ready to be compiled with TIMACHINE (from Novasoft). The program will work just as it is in BASIC too. Program execution begins at line 9000. Lines 9000 to 9090 are program initialization.

Listing A is a copy of the BASIC program in demo form. The TIMACHINE compiler directives are already set up so you can compile the demo. Although the program will work in BASIC, it is B-L-O-N!

Following the program listing is the CN-TYPE output for debugging the program (listing B...see the May/June '87 issue of TDM). Listing C is the TIMACHINE output. Listing D is an excerpt from a sample menu that shows how to set up a 2 header menu.

Other Program Notes: Line 9044 contains the bytes for the arrow cursor UDO. Lines 9290 to 9360 perform the cursor movement. Line 9355 contains a PAUSE 4 to control cursor speed.

I hope you enjoy playing with this demo, and maybe someday we'll see some T52068 programs using real drop down menus.

Listing A

```

0000 REM *****
0010 DATA *****
0011 REM *****
0012 DATA *****
0013 REM *****
0014 DATA *****
0015 REM *****
0016 DATA *****
0017 REM *****
0018 DATA *****
0019 REM *****
0020 DATA *****
0021 REM *****
0022 DATA *****
0023 REM *****
0024 DATA *****
0025 REM *****
0026 REM *****
0027 REM *****
0028 REM *****
0029 REM *****
0030 REM *****
0031 REM *****
0032 REM *****
0033 REM *****
0034 REM *****
0035 REM *****
0036 REM *****
0037 REM *****
0038 REM *****
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0040 REM *****
0041 REM *****
0042 REM *****
0043 REM *****
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0059 REM *****
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0070 REM *****
0071 REM *****
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0080 REM *****
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0099 REM *****
0100 REM *****
0101 REM *****
0102 REM *****
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0107 REM *****
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0115 REM *****
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0123 REM *****
0124 REM *****
0125 REM *****
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0198 REM *****
0199 REM *****
0200 REM *****
0201 REM *****
0202 REM *****
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0232 REM *****
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0240 REM *****
0241 REM *****
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0249 REM *****
0250 REM *****
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0255 REM *****
0256 REM *****
0257 REM *****
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0259 REM *****
0260 REM *****
0261 REM *****
0262 REM *****
0263 REM *****
0264 REM *****
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0808 REM *****
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0861 REM *****
0862 REM *****
0863 REM *****
0864 REM *****
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0876 REM *****
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0880 REM *****
0881 REM *****
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0891 REM *****
0892 REM *****
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REVIEW THE TS2068 AND THE COMMODORE 1520 PLOTTER

reviewed by Frank Davis

Something I have really missed, not being able to do with my TS2068 is using it with a plotter. This was most unfortunate as I had used one on an earlier system I owned... a 1520 (by Commodore). I had used a 1520 Color Plotter Printer. I was at the point of working out the problem of interfacing the rather unusual serial port on the Commodore 1520, when I picked up a magazine and found an ad for an interface and software to run the plotter on the Times Square TS2068. I sent for some information and very shortly had the kit in my hands to begin the task. NOTE: Get the kit if you know what you are doing and are not rusty at the soldering iron... otherwise order the completed interface.

The Commodore 1520 uses paper slightly wider than that used by the TS2068 printer, but not the standard 8 1/2" is under 5". However, it is regular paper and is available from Commodore, Radio Shack and many Atari dealers. They also carry the four colored pens used in the plotter. All of these brands make a similar plotter, and each set up to interface with their particular computer. The colors are black, blue, red and green. In all the years I have had this plotter, I have had but one problem with it... a small plastic gear coming loose and not being able to turn the other gears to move the paper back and forth. A small amount of super glue gel seems to have cured this. If you ever have to do this be careful not to get any in the grooves of the gear itself.

The graphics you can do with this interface and the available software for it is by no means limited. John McMichael, the designer of the interface and the programmer does not keep any "demo" features. The Driver program that comes with the interface contains a very extensive demo of just what can be expected of this combo. You can also examine the demo program, but not copy it to the 2068 printer or LIIST it. You can also clear out the BASIC receipt line 10 which you will need to load the machine code and use this driver for your own programs. This is a better deal than I got from Commodore when I purchased the plotter originally, it had no ready to run program with it, no driver only a manual with a few short sample

programs of which all but two of these contained errors in the programs.

Other software available for this interface include the following: A. SCREEN-TO-PLOTTER, which allows you to use the plotter like a connect the dots, by use of the cursor or a joystick, save text, save screens or load in previous, saved screens and edit them, all in four colors. When using text you have many choices, such as solid lines or dashed lines, size of print, character rotation, centering. You change colors in pictures or text as simple as hitting the letter "F". This is a user friendly program.

B. CHG 1520, is a program which allows you to combine Customized SCRIPT V5 or V5.2 and the 1520. This allows the use of the 1520 as an 80 column printer in color and the use of all of the 1520 functions in a text file.

C. PIC PLOT which allows you to do a dump of a screen to the 1520 in two sizes. You can select one color for the small plot and two colors for the larger plot. It also allows you to put colored captions or subtitles below the pictures.

D. BANNERFIC, a program that allows you to use the 1520 to make colored banners. You may plot up to two hundred characters using the special UDBs that come with the program, or use those of the ROM set. It has 50 selectable character sizes and each character can be whatever color you assign it. The banner may have the characters displayed either as vertical or horizontal, and the characters may be inverted or done as an over character. You can select proportional spacing or not. The only thing missing here was the option to fill in the character or not to fill. It should be easy to use your own UDB's with this program.

The 1520 is an ORPHEAN in its own right. It is no longer available from Commodore in the U.S. I have seen some ads for it in some British Mags... along with the VIC20, still being offered for sale. This means that you first need to get one before you invest in this lively interface and software. They are available at many TDY-R-US stores across the nation for \$30 to \$40 (not bad when I think of the \$199 many people paid). You might just check a local Commodore Users group to see if someone wants to let go of one. Also check your local Commodore Dealer to see if he still can get you one. I saw used ones for sale at each of the computer and ham shops I went to this last year. They were also being offered for \$49.95 + \$5 SH by ALL ELECTRONICS CORP., PO Box 20460, Los Angeles, CA 90064, 1-800-826-3432.

To get more information about this interface and the software, write to: John McMichael, 1710 Palmer Drive, Laramie, WY 82070.



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Z-COLUMN

The "Z-COLUMN" is a new and regular (hopefully) feature of *TIME DIGESTS*. We will cover new and helpful tidbits of information for the Z88 Laptop Computer...the newest addition to the Sinclair family tree. On occasion, we may also accompany this column with an article or product review.

What better way to kick off a new column than to make a major announcement? Yes, that's right...just as Cambridge Computer (Sir Clive's new company) promised...the Z88 has passed the FCC test, and is now available here in the U.S.!

While some details were sketchy at press time, we do know that Cambridge Computer has signed a deal with a U.S. distributor, and that the new computers are being assembled by SCI in Huntsville, Alabama, with foreign parts. SCI is a U.S. based corporation that has worldwide concerns, and is in fact manufacturing the European Z88 for Cambridge, in a Scotland factory.

The U.S. Z88 is reported to have an updated ROM. It also has a steeper retail price than that most of us anticipated...\$549.90. No getting around this, the weak dollar has driven prices up. (In fact all personal computers are going up in price for the first time in years. And Japanese RAM chips are once again expensive.) Some folks will certainly shy away from the price, but this is the most powerful (for its size and weight) laptop computer currently on the market.

1/2 Meg RAM cartridges are now available for right around \$400. With three of these installed, it gives the user 1 1/2 Meg to play with "on the go". The 1 Meg cartridges are still supposed to be released in a couple of months.

Lots of third-party support taking off now in Europe. Here are a few of the most recent developments:

Z-TERM is a new telecommunications package (a U.S. version is available) that supports XMODEM, it auto-dials, and can drive virtually any modem, including the new miniature Z88 modem from *Arctis Systems*.

Commwin will have their disk drive interface (with ROM socket output) available soon for \$199. It works similar to the Radio Shack floppy drive system for the Model 100.

Focus Magazine (the publishers of *EL WORLD Magazine*) will launch their new Z88 specific magazine this month.

The *Z88 Users' Club* of Great Britain has formed, and already has four club newsletter publishers, called the *Z88 EPSON*. For further information, write to Roy Woodward, 48 Wellington Street, Long Eaton, Nottingham, England NG10 4NS. (Thanks to Larry Chavira of Canada for supplying this information.)

While I attended the *ROUNDTOP TO WINNERS* in Orlando, Florida, I had the privilege of meeting Stan Veit, who is the Publisher/Owner/Editor-in-Chief of *COMPUTER SHOPPER*. While Mr. Veit had attended the *Fall Condex* in Las Vegas, a representative from Cambridge gave him a Z88 for review (see the March '88 issue of *Computer Shopper*). Stan uses the Z88 as his "electronic notepad" wherever he goes. Now here is someone who has access to virtually any PC or laptop...and actually prefers the Z88 for some applications over the others. He mentioned that the "silent keyboard" is a big plus in conferences.

Well, no doubt, many of you are skeptical about this new computer, and the price alone will drive a big share of the "hardcore" Sinclair types away. But nevertheless, this is an excellent laptop computer,

and the finest computer for Sir Clive to date. It's not another Sinclair "Beeboggle" (as one newsletter editor called it...yet admitted he had never used one before). While at the Florida Winfest, the same comment was heard time, and time again at the SWAPP booth: "This is what the QL should have been!" (It's not knocking the QL though, as it does have merits of its own.)

Sir Clive himself is very serious about this computer, and wants to insure its success. Bryan Davies, a columnist for *EL WORLD*, recently told me on the phone, that the last *MICROFAIR* (a trade show open to the public) he attended, found Sir Clive up on the stands demonstrating the little "Z" to attendees.

That's about it for this issue. Hope to be back next issue with more stuff. Until then, you can send a S.A.S.E. to me in care of *TIME DIGESTS*, and I'll send you some info on a user group starting up here in North America. (If you have already sent your envelope...I will finally have this--promise!)

- Tim Modis

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by Syd Wyncoop

23

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Print Style Menu
Print style menu selection panel is sent to CR

Print heading
clear CRT and print heading
initializes pointer for CR
print strings function
go do it

Print Type Menu
Print type menu selection panel is sent to CR

Print type menu
clear CRT and print heading
initializes pointer for CR
print strings function
go do it

Print Another Selection?
Print another selection message

Print again?
initializes pointer for CR
print strings function
go do it
get response

Print Done Yet?
Print done yet

Print done?
initializes pointer for CR
print strings function
go do it
get response

Fill Print Buffer
address of the table entry to be moved to print buffer

Print get bf
move pointer to BE
retrieve print buffer pointer
exit byte to put in print buffer
and check for terminating byte
exit loop if found
else, move 16 to print buffer
and adjust pointers
stay in loop until done

end fill
store print buffer pointer for next move

Get T/R Response
Get T/R response

Outputs A = 0 if yes or 1 if no
A = 0 if no

get_rn
get r/n response
was it real?
yes set zero flag
no set zero flag
was it not?
do again, was not valid input
clear zero flag
A = 0
do again, was not valid input
indicate yes or no

yes
no

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Direct Keyboard I/O
Inputs none

Outputs A = carriage return, or capital asset key pressed
direct to 16 0,3 console input function
call hds max 4,0 console is capital w/o displaying CR
ret

Console Input
Inputs/none

Outputs A = numeric keyboard entry = 1 x 4, or a carriage return
or numeric keyboard entry = 1 x 4, if valid entry
or set if carriage return pressed

get_rn 16 0,1 console input function
call hds check for default request
or a or only return if found
call numeric? task for valid digit
or a create input and reject if not
sub '1' remove ascii base
or a create input add a, a
add a, a
16 0,0 and convert to 16 bits
ret

ascii_input 16 a,0 backup the cursor one space
16 0,1 print a character function
call hds go get a good digit
or get_rn

cr_only set indicate CR pressed
ret

Numeric Input
Inputs A = ascii character code from keyboard input

Outputs CARRY = reset, if is valid numeric input
A = number

numeric? op '0' is it < 0?
ret c exit if no
op 0-9 is it < 0-9?
out ensure carry reset
ret

Decimal Input
Inputs none

Outputs A = numeric number in the range 0-255 (CR and 256)
or numeric number in the range 0-255
or CARRY = set if CR is used for defaults

dec_input 16 hi,lopt_buf input buffer
16 hi,lopt_buf for 3 digits max/min
16 hi,lopt_buf advance pointer
16 hi,lopt_buf and clear digit counter
16 hi,lopt_buf advance pointer
16 hi,lopt_buf set counter
16 hi,lopt_buf and prefix buffer with CR's

16 0,lopt_buf point to buffer, which is now ready for
16 0,lopt_buf read console buffer until CR function
call hds get input
set # of digits received
and we get as digit
if not, assume default value

16 hi,read_buf else, get pointer to buffer contents
16 0,lopt_buf ensure 2 result
16 0,lopt_buf pre-load B, for later use
push hi save digit pointer
16 a,hi,lopt_buf retrieve digit
call numeric? is it a number?
16 0,lopt_buf exit if not

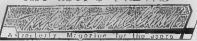
sub 0' remove ascii bias
16 a, a store it temporarily
16 0,hi,lopt_buf get old number
16 0,hi,lopt_buf multiply x 2
16 0,hi,lopt_buf and save it
add hi,lopt_buf multiplier x 4
add hi,lopt_buf multiplier x 8
add hi,lopt_buf multiplier x 16
add hi,lopt_buf add in current digit
16 0,hi,lopt_buf set number back in BE

16 hi,lopt_buf,ent do hi,lopt_buf,ent
pop hi retrieve digit pointer
16 a, a and do
16 hi,lopt_buf else, adjust pointer
16 0,lopt_buf and convert next digit

1 end dec 16 a, a put number in A as we expect 0-255
ret

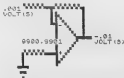
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MICKEY-MOUSE GRAPHICS

by Fred Nachbaur, D.J.M.J.T. *

I'll start this article with a little T/S soap-boxing. Perhaps I should add the disclaimer that these are my views, not necessarily those of this magazine (or anyone else, for that matter).

Recent times have seen a lot of attention to video digitizing; converting an image from a video signal or from hardcopy, into an image in computer RAM, which can then be displayed on the CRT screen. This results in realistic images ONLY if you happen to have a color Mac or an Amiga, with their ultra-high resolution, huge color palette, and correspondingly humongous RAM.

However, when using the Timexes and Sinclairs (even the 2068 and QL), this has always struck me as a case of the tail wagging the dog. Even the best images that result are grainy, with unrealistic colors. In short, "Mickey-Mouse."

The situation gets even worse when converting such images back to hardcopy. When using a printer, even the finest software gives only rather primitive grey-scales. Color plotters might seem to be an improvement at first glance, but with their palette of (typically) four colors, the pictures that result are usually little more than interesting curiosities.

What has always fascinated me about the computer is its capability to GENERATE graphic images. What does a computer do best? Compute! I.e., crunch numbers, slavishly running complex mathematical formulas and displaying the results in graphical form. From this viewpoint, the only difference between the ZX81 and the Cray II is speed of execution. (Well, OK. There may be one or two other, albeit minor, differences.) To paraphrase an ancient philosopher, "Give unto VCR's that which is video, and to computers that which computes."

It is entirely thanks to the computer that a whole new geometry has emerged; the "fractal" geometry discovered and pioneered by Benoit Mandelbrot and friends, and explored by countless amateur computerists. Fractals are not the only "interface" between mathematics and art; the side-panel accompanying this article, showing how a mouse hatches from an egg, was done with Fourier analysis, a mathematical procedure two centuries old. Want more? How about wire-frame graphics of geometric shapes, "wallpaper" algorithms, "Nautilus rogs," spirograms, and on and on.

Very well, now that your computer has taken some nifty algorithm and transformed it into a breath-taking display, how do you save it for posterity? Sure, you can save screens and recall them later, but what if you want faithful hardcopy? As mentioned earlier, ordinary printers work fine with monochrome images and line-drawings. Inexpensive color printers or plotters work a little better, since they can print in red, green and blue in addition to black. Such images still fall far short of the color capability of the QL, TS2068, or TS1088 with Oliver II video. Sure. Guess we'll just have to go out and buy a \$2000 color laser printer. WRONG!!

Super-CHEAP Super-GRAPHICS

Timexers have become renowned for finding simple solutions to hairy problems. Is there an inexpensive way of getting faithful hardcopy of even the most complex color screens? Going further, is there any way of getting color hardcopy from a completely stock TS1088 with its black-and-white TV? The answer to both questions is YES. Would you believe that the first is possible with hardware you probably already own, no additional software, at a cost for supplies under 50 cents per copy? Or that breath-taking color from a ZX81 takes just a little more software savvy, patience, and experience?

The solution lies in something that might seem pretty "Mickey-Mouse" at first, but is really very elegant and simple. We're going to take a look at an "ancient" technology, going way back to a certain Mstr. Dagonne. That's right; ordinary, everyday photography. Many people are under the delusion that taking a picture of a CRT screen is impossible, or at best, very difficult. In actual fact, it's barely more involved than taking a snapshot of your fishing buddy proudly displaying his prize minnow.

* Dabbler in Many Mund, Interesting Technologies

THE POLAROID APPROACH

I have seen acceptable snapshots done with some of the newer Polaroid or Kodak "instant cameras." These have the advantage of providing hardcopy within seconds of taking the snap. However, there are a few problems associated with these that make them less than ideal, assuming that you don't need the "instant" feature.

One problem has to do with parallax. At the close range that is required, these and other "viewfinder" cameras will displace the image because of the distance between the viewfinder and the "taking" lens. Another problem is that the user seldom has full control over exposure time and lens aperture. Further insight into this may come when you read the following section. Lastly, your acquired picture is the only one of its kind. There is no cheap way of making dupes and enlargements, or correcting minor exposure or framing errors.

THE VERSATILE SLR

I've found the SLR (single-lens reflex) 35 mm. camera to be the best tool for taking photos of computer-generated images. Even a cheap, used, off-brand model will be fine for the task at hand. Since focusing and framing is done via the same lens as is used for taking the actual picture, there is never a parallax problem. Furthermore, you generally have full control over exposure time (shutter speed) and aperture, the two main variables determining your final picture.

A tripod is very helpful, almost essential. You CAN do without it, by bracing your camera atop a stack of books or other props, but a decent tripod makes it SO much easier and less frustrating.

SHUTTER SPEED

The reason that a tripod is needed, is because acceptable pictures are only produced at slow shutter speeds. Consider that a TV or monitor screen is basically a serial device, scanning a complete picture in 1/60th of a second. If shutter speed is less than 1/40, then only a portion of the screen will actually expose the film. Also, actual shutter speed at 1/60th will rarely be EXACTLY the same as the vertical interval of your computer, nor will it be in "sync". The result can be narrow bands of darkness (not exposed), or brightness (partially double-exposed). Since most SLR's have a "focal-plane" shutter, they will also tend to introduce diagonal bars or "tears" in your picture if the timing isn't perfect. Shooting at 1/30th reduces both effects, and shooting at 1/15 virtually eliminates them. However, to be completely safe, you might consider shooting at 1/4 sec. This corresponds to an exposure of 15 frames; one partial exposure out of 15 full ones will never be noticed.

APERTURE

The other control that varies the amount of light that reaches the film is the lens aperture setting. There are basically two ways of setting this; by using a light-meter, and by trial and error. If you use a light meter, fill your screen with a representative image, to get a reasonable starting point.

WARNING TO ADVANCED SHUTTER-BUGS: Even though your CRT is actually emitting light, DON'T use an incident light meter. Use your good old reflected light meter. The reason is that the CRT behaves photographically AS THOUGH it were reflecting light from an external source.

If you use the trial-and-error approach, shoot a test roll at various apertures, at both 1/8 and 1/15 second shutter speeds. Fill the screen with a representative image, containing approximately equal areas of all colors. When the roll comes back, look at the NEGATIVES to find the one(s) that have the best exposure. HINT: use a B&W film of the same speed as your proposed color film, and "develop only" to keep costs down.

Whether you use your light meter, or the trial-and-error approach, don't go whole-hog on your first session. Have your first run of pictures developed first. You can thereby inspect the negatives to make any necessary corrections. One reason is that some films exhibit "reciprocity effect" at long exposure times, making light meter readings less accurate. Another is that the garden-variety "averaging" meter may not give a true reading with the photographically "unusual" subject matter.



Adjust your contrast and brightness as well as the color controls to give the clearest picture possible. A lower "brightness" than usual will generally give superior photos. At the other end, extremely dim screens will typically have a bright "edge" or "flare" at the juncture of different colors. If you have a video peaking control, adjust it to give a sharp image without flares. Mark the optimum settings with a Dymo marker, to make your setup easy to duplicate next time. Unless you're experimenting with special effects (see below), be wary of changing your monitor settings during a photo session.

I found that when using my 13" Saketa color monitor with the SLR, and shooting on 200 ASA Fuji film, my optimum setting was f11 at 1/15 sec., and f16 at 1/8 second. The pictures shot at 1/15 were indistinguishable from 1/8 second, using an older-model Canon SLR.

If you have several monitors, use your best one for your photo sessions. Look at color saturation, sharpness, and geometry (are rectangles truly rectangular? Are circles circular?).

LIGHTS OUT

This is important. If you ignore this, you'll be sorry when you get your prints back. When taking your picture, the room should be completely darkened. The ONLY light source should be your monitor. The reason is that any light in the room will cause reflections from the front glass of the monitor. "Anti-reflective" coatings or glass will NOT eliminate this effect! You may not even notice it while taking the pictures; the eye (brain) is remarkably adept at tuning out such "noise." The camera, however, is adamantly unforgetting.

Other advantages to "lights out" are that blacks will truly be black, and that the frame of the monitor will usually not show. If it does, consider painting it black for covering with black camera tape) before further experiments.

This next admonition may sound silly to advanced shutter-bugs, but you'd be surprised at how many people will make this error: using an electronic flash. Pictures taken with a flash will only be pictures of a blank white screen. Remember, the video display is a light SOURCE. It does NOT operate by reflecting incident light. Using a flash will completely wash it out.

FRAMING

As mentioned earlier, using an SLR will allow you to exactly frame your picture. Take the time to frame your screen properly. Not only should the TV screen be centered in your viewfinder, but it should also be free of distortion because of an improper viewing angle. Pay close attention to the top and bottom: if the top is wider than the bottom you'll have to physically lower the camera, and vice versa. Same goes for left-right alignment. Stand back from your setup as another check: the plane of the TV screen should be exactly perpendicular to the camera lens' line of sight. (Now do you see why I recommend using a tripod?)

Finally, don't fill the entire viewfinder frame. Most cameras (the inexpensive ones, anyway) don't have an exact correlation between the borders of the viewscreen, and the actual edge of the film image. Furthermore, in process of printing, a little bit of the image is always lost around the edges. Keep the TV screen image in an area about 90% of the full viewscreen, and you should be alright.

Advanced Topics

If you're a more advanced photographic enthusiast (perhaps even a professional), there is really no limit to the magic you can do with your computer and camera. I'll touch on some ideas for you to experiment with.

MULTIPLE EXPOSURES

If your camera allows double or multiple exposures, and if you have at least some software expertise, you can have yourself a field day.

How about unlimited colors? One way to do this is by using your TINT control to give colors not "normal" for your machine: e.g. browns, flesh tones, violet, etc. The reason I mention software expertise is that you'll have to figure out some way of "filtering" all but the desired color(s), leaving the rest black. Make an exposure of these colors, then reprint the screen with your "alternate" colors, adjusting TINT to give the desired effect. Make the second exposure. Continue as far as practical, or you have patience for.

At the beginning of this article I promised a way of displaying full-color images from a stock ZXBI, using an ordinary white-screen TV set. Again, multiple exposures can be used to display as many colors as you like. This time, however, you'll need a set of optical filters of the desired colors, as well as the ability to do "software filters" to display only the material of each color for each exposure. Ordinary colored cellophane actually works surprisingly well. If you're in a larger city that has a motion-picture supply house, try to get a booklet (usually free) of "sample" lighting filters, as supplied by Lee and other companies.

When using optical filters, you'll also have to know the "filter factor" for each color filter used. If not given, you can get an approximation by using your light meter: point the camera at a blank white wall, and note the f-stop reading. Put the filter in front of the lens, and determine by how many stops the light has been decreased by the filter. This will typically be between 1/2 and 2 f-stops. Use this data to compensate your aperture opening during exposure.

Let's say you want to do a color picture of a particularly neat fractal. Plot only those points corresponding to each color, then shoot it with the appropriate filter. Continue to your heart's content. In principle, especially if you are doing the picture in MOXIE hires, you can come up with pictures that look as if they were done on a Mac.

When doing multiple exposures, a GOOD tripod is absolutely essential. So is a bulb or cable release. The SLIGHTEST movement will throw your picture out of registration, and thus betray your "secret."

Another factor that affects registration is electronic in nature. Especially at high brightness, the distribution of light and dark on a CRT can affect the width (and sometimes even the height) of the displayed image. This is called "blooming." Reduce blooming to a minimum by using the lowest brightness that will give an acceptable picture.

Many cameras, especially the more modern ones, are extensively interlocked against accidental multiple exposures. Fine for the ordinary snap-shooter, but a real bane for advanced amateurs and beyond. Some cameras can be "tricked" into multiple exposures by holding the rewind release button while advancing the film. I say "some," because while many will allow this, they may not

keep perfect registration. The only way to find out if your camera holds the film securely enough during this operation, is to experiment.

This next suggestion might curl the toe-nails of pro's and semi-pro's, but don't write it off as "just one of ol' Fred's ravings." Remember the Argus C-3? These were made by the millions in the '50's, and are still giving camera reviewers flashback nightmares. However, it is IDEAL for playing around with computer photography. Why? Let me count the ways. It can be picked up CHEAP at any photographic junk shop. It uses readily available 35mm film. It has a between-the-lens leaf shutter, causing much less trouble with video images than do focal-plane shutters. It is almost too easy to double expose. Its blocky shape is a boon if you don't have a tripod, and rely on a stack of bricks to keep your act together. Focusing is easy with its split-image rangefinder. The only thing you'll really have to worry about, is parallel. However, this won't take you long to compensate, with a little experimentation.

SELECTIVE DEFOCUSING

Getting back to our friend, the SLR, there is another trick you can use to actually IMPROVE the image you see on the TV, especially with color monitors. Since these have discrete dots making up the plane of the display, the photos that result can have an obviously grainy "video" look.

Most SLR's automatically open the aperture all the way during set-up and focusing, both to allow for maximum brightness and to narrow the depth-of-field to make focusing easier. However, all but the cheapest ones have a way to override this, so you can view your scene at the actual aperture selected. You can use this feature to slight y de-focus your image, causing the discrete phosphor dots on the CRT to blend together.

You'll have to use judgement, and the wisdom of experience, to determine how much defocus is ideal. Not enough, and you still have the grain. Too much, and you lose resolution, making the picture look out of focus. Done right, however, it will be difficult to tell that the resulting photos were shot from a TV or monitor screen.



A PARTING SHOT....

I'll leave you with a little anecdote. Shortly after the ZX81 came out, I worked up my first "big" program. The TS2048 was not yet available, and I refused to buy that awful "ZX" printer. Guess how I generated program listings, and screen dumps for my documentation? That's right, I used my trusty rusty SLR to shoot each screen, then had life film contact printed. Early purchasers of my original FOURIER package (the predecessor to the program that did the side-panels shown here) may still be wondering to this day, how I got those clean, sharp "mini screen-dumps" back in those bad old days. Well now you know.

The circle is complete. From a stop-gap measure because suitable printers didn't exist, to high res color fractals, good old conventional photography STILL has little competition on if you want striking color hardcopy of your graphic computer displays. Especially if you consider the cost!

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PLAYING WITH ELECTRICITY

Harvey Taylor



Worked away in a description of the QL hardware in the Technical Guide is mention of the fact that bit 7 of the Display Control Register can be used to switch the base of screen memory from \$20000 to \$20000. Baaa, interesting I thought and went on to more pressing concerns.

Recently, I went back to investigate the dual screen display. There is a discussion & program dealing with it in Adrian Dickson's "QL Advanced User Guide". The news is it is real, but flawed. First a quick overview of the QL memory map.

Mode 4	Even Byte	Odd Byte		
	7043210	7043210	- Bits	G - Green
	00000000	00000000		B - Red
				F - Flash
Mode 5	Even Byte	Odd Byte		
	7043210	7043210	- Bits	B - Blue
	00000000	00000000		

Passing SCLB the parameter 8, will paint the screen black. You can play with other parameters to see the effect of setting various bits. If you use \$2000 for Green, the interpreter returns an overflow error; but -230 works fine. 255 paints the screen red.

The procedure SCRM turns off the Auto-Toggle and gives you the default display, ie Screen0. The procedure SCLB turns off the Auto-Toggle and gives you Screen1. The procedure SCRA turns on the Auto-Toggle, ie, switch between the two screens using <CTRL>+F5.

The function SCREEN tells you which screen is currently being displayed, 0 or 1. The function DWRK tell you the base of the Common Heap Memory reserved by the initialisation code.

There are some provisions with this code. It should be initialised from a boot, ie, particular before a directory of a second device is done. This is because we want Screen1 to begin as close to the Base of the Common Heap as possible. If you do a directory of another device before initialising, 4000 reserves some common heap as a Channel Definition Block and a Physical Definition Block. This will show up as a white band similar to what SWITCH produces.

Related to this situation is the value of the Timeout value used to wait before switching Screen1 on. See the comments in the .asm file.

The other provision, is that the dividing line where Screen1 switches in is not stable. The easiest way to handle this problem, is to put a black border over the region similar to the procedure BDRM below.

The first Basic program below creates a file SCRM.ext which is used by the second Basic program BDRM.

K	HEX	USE
250K	00040000	Top of On Board RAM
192K	00020000	Top of Screen1
		Top of Common Heap
		Base of Common Heap
160K	00020400	Top of Sys_Var
	00020000	System Variables & Base of Screen1
	00020000	Top of Screen0
130K	00020000	Base of Screen0

The immediate problem with the second Screen is the fact that the System Variables are locked into \$20000 which is the base of Screen1. This means that if you simply flick the bit which controls the base of the display, you will get a bunch of garbage on the screen. The garbage is the video representation of the System Variables.

You can take a look at this effect with the following short Superbasic Procedure:

```

100 REMARK switch in Screen 2
110
120 DEFine PROCEDURE SWITCH
130   SW MCSTA:=150000   REMARK $20000
140   DC_RMT:="0400" REMARK $10000
150   SCR_STATUS:=FREE(SV_MCSTA)
160   SCR_STATUS:=DCR_STATUS "" 120: REMARK toggle bit 7
170   FOR SW SV_MCSTA,DCR_STATUS: REMARK tell Sys_Var
180   NEXT SW
190   SCR_STATUS:=DCR_STATUS: REMARK tell hardware
200 END DEFine SWITCH

```

This is interesting, but useless. To make a useable display, one has to be a little trickier. One of the neat things about the QL is that 4000 is extensible. In particular, one can link in tests for the QL to perform after each interrupt. There is a Level 2 Interrupt (called a Frame Interrupt) on the QL every 1/80 second, which is related to the Vertical Sync signal.

What we need to do is link in a short task which checks what screen we are displaying, then if we are displaying Screen0, do nothing, while if we are displaying Screen1, wait until the display has passed the SK or so of System Variables then switch in Screen1.

The assembly language code to do this is listed below in the file BDRM.asm. Once you have this code installed, you will run into the next problem. There is no support in QLROM for writing to Screen1. It is evident that in the development of the QL, this was a matter of some debate, because in the SCR/CON Channel Definition Block (CD_S1B), there is an entry (\$0_S1B) Base address of screen1. The unfortunate fact is that the SCR/CON device driver does not use this variable. Instead the base address (\$20000) is hardwired into the driver. This was no doubt done in concert with the decision to tie the System Variables at \$20000.

As the QL is at present, if the driver did use the CD_S1B variable, clearing the screen would erase all the System Variables, so it is just as well that it is not implemented!

What's to do? It seemed to me that the simplest method to use would be to simply copy Screen0 into the useable part of Screen1. The Superbasic extension SCOPY performs this task. I wrote a Clear Screen1 capability as well, so I added the procedure SCLB. This procedure expects one parameter which is used to colour Screen1. The video ram of the QL display is arranged thus:

```

100 REMARK PLAY WITH SCREEN UTIL.
110
120 LAYOUT
130 INIT
140 DEMO
150 STOP
160
170 DEFine PROCEDURE DEMO
180   PAPER 0: CLS
190   PICTURE
200   PAPER 4
210   AT 0,0: PRINT 'SCREEN 1'
220   SCOPY
230   SCB1
240   CLS
250   SCRM
260   SCRA
270   LIST TO 260
280   AT 0,0: PRINT 'SCREEN 0'
290   PRINT#0,"USE <CTRL>+F5) TO TOGGLE SCREENS"
300 END DEFine DEMO
310
320 DEFine PROCEDURE PICTURE
330   FOR M=0 TO PI STEP .25: FOR N=0
340     TO 180 STEP 15: INK (RND(2,0)): CIRCLE 20
350     0,120,N,.5,M: END FOR N
360   NEXT M
370 END DEFine PICTURE
380
390
400 DEFine PROCEDURE INIT
400   name="SCR2_ext"
400   device="fip:"
400   LAYTEX device & name,RESPR(512)
410   PRINT'Loaded'

```

```

438 CALL RESPR(0)
439 PRINT 'Initialized'
440 END DEFINE INIT
450 :
455 DEFINE PROCEDURE LAYOUT
470 WINDOW#0,512,0,0,0 - BORDER #0,10,0
480 WINDOW#1,512,192,0,64 : BORDER #1,10,0
490 WINDOW#2,512,192,0,64 : BORDER #2,10,0
500 PAPER#2,4 INK#2,0
510 PAPER#1,4 INK#1,0
520 PAPER#0,2 INK#0,7
530 SCALE 256,0,0, MODE 4
540 END DEFINE LAYOUT
550
100 REMARK Create SCR2 EXT file
110
120 DEAD
130 DSAVE
140 STOP
150 :
160 DEFINE PROCEDURE DSAVE
170 REMARK Save memory to file
180 name$='SCR2_ext'
190 dev$='f1p1'
200 $BYTES dev$ & name$.RESPR(0),400
210 END DEFINE DSAVE
220
230 DEFINE PROCEDURE BLOAD
240 REMARK write data to memory & init PRXC & YUNC
250 addr=RESPR(512)
260 RESTORE 600
270 REPEAT loop
280 READ n: IF n=-1: EXIT loop
290 POKE addr,x
300 addr=addr+1
310 END REPEAT loop
320 PRINT#0,'Loaded'
330 CALL RESPR(0)
340 PRINT#0,'Initialized'
350 END DEFINE BLOAD
360 :
370 REMARK SCR2_ext code for 2 screens utility
380 REMARK CLC, SCOPY, SCRB, SCRI, SCRA, SCRW, SPCRC
390 REMARK
400 DATA 67,250,0,70,52,120,1,16
410 DATA 70,140,116,0,34,00,0,3
420 DATA 0,0,55,240,0,2,128,0
430 DATA 32,40,0,0,63,240,0,0
440 DATA 146,130,47,1,112,24,70,0,5
450 DATA 34,31,74,120,102,24,07,770
460 DATA 1,16,34,130,67,250,1,24
470 DATA 60,250,1,12,112,20,32,73
480 DATA 0,4,70,80,112,0,70,117
490 DATA 0,5,0,144,4,03,07,02
500 DATA 65,0,0,144,4,03,07,02
510 DATA 48,0,0,144,4,03,07,02
520 DATA 49,0,0,0,5,03,07,79
530 DATA 00,00,0,34,4,03,07,52
540 DATA 02,0,0,0,0,2,0,174
550 DATA 0,03,07,02,70,85,77,0
560 DATA 0,116,6,03,07,72,00,02
570 DATA 00,0,0,0,52,100,1,16
580 DATA 70,140,74,120,102,0,12,07
590 DATA 0,1,103,4,112,24,70,117
600 DATA 40,54,102,0,65,200,0,154
610 DATA 32,00,07,240,0,3,0,0
620 DATA 48,192,177,201,101,250,00,0
630 DATA 0,132,07,240,0,3,0,0
640 DATA 32,0,05,250,0,124,32,00
650 DATA 144,130,83,04,00,240,0,2
660 DATA 120,0,19,34,01,200,235,202
670 DATA 00,00,07,250,0,104,00,200
680 DATA 00,00,07,250,0,00,00,0,1
690 DATA 00,00,07,250,0,00,00,100
700 DATA 0,200,00,72,07,200,0,74
710 DATA 34,17,34,110,0,00,03,73
720 DATA 45,73,0,00,00,110,152,0
730 DATA 74,120,103,10,02,00,6,32
740 DATA 03,05,227,120,104,200,220,145
750 DATA 01,130,102,0,45,120,152,0
760 DATA 120,2,00,24,114,1,104,00
770 DATA 0,20,34,110,0,00,05,73
780 DATA 45,73,0,00,01,120,102,0
790 DATA 50,00,0,3,112,0,70,117
800 DATA 0,0,0,0,0,0,0,0
810 DATA 0,0,0,0,0,0,0,0
820 DATA 0,52,10,103,0,1,120,00
830 DATA 74,43,0,7,100,20,74,174
840 DATA 0,152,102,50,74,174,0
850 DATA 102,44,74,46,0,230,102,30
860 DATA 40,00,0,44,01,200,235,254
870 DATA 0,103,0,7,10,103,0,1
880 DATA 120,00,74,43,0,6,103,14
890 DATA 74,46,0,51,103,0,01,230
900 DATA 0,51,70,43,0,7,70,117
910 :

```

MANDELBROT -- A Fractal World

Part Three

Michael E. Carver

The Machine Code

Now that we have the BASICS out of the way, we can get down to the microcode or the machine code portion of our program. It is not my intention to provide an introductory lesson in 68000 assembly language programming with this article. However, I do intend to cover GL specific instructions (i.e., Traps and Vectors). There are a number of books available to teach the basic instruction set of the 68000 family of chips. One series of books is available from Motorola for a very reasonable charge.

Before I get started with our discussion of the various supporting machine code programs, a short disclaimer. This program was my first attempt at coding in 68K code. Experienced programmers will find some awkward and round-about approaches in the code.

MANDELBROT SOURCE CODE

start

One of the important things to remember, when writing machine code for the GL, is that the Register 00 must contain the value of 0 for a successful return to BASIC. The GL uses this register to provide

for error traps and reports when returning from Trap or Vector calls. Any value, other than 0 in R0, is seen by the RCM as an error when returning to BASIC, or concluding a Trap/Vector call. See pages 19-20 of the Concepts section of the GL User's Guide for a breakdown of the Error Report Codes. R0 will contain a negative value for an official error (i.e., -1 = not completed -2 = invalid job, etc.). The first routine in our source code, `array`, simply locates and stores the location of the array data area to be used by the machine code program.

calc

Our next section is one of the round-about methods I warned you about. Its role is to retrieve, from BASIC, certain floating point values needed for the reiterative calculations. The straight-forward approach would be to obtain these values from within the machine code program, using an input from keyboard routine. Even so, some valuable lessons can

be learned from this section of code. In the GL, the SuperBASIC memory area is dynamic. It can grow or shrink and move about within memory. For this reason, the A6 register is used to point to the base address of this area. Any particular location in this area, including SuperBASIC system variables or the BASIC program, is referenced relative to A6. Each area of this memory is indexed by two pointers, for the start and the end. These "stacks" are upside down. The SuperBASIC system variables start at offset \$000. (NOTE: I will be using "x" to indicate numbers in HEX.) Each procedure, function, and variable created from within SuperBASIC is indexed via a name table and a name list. Their starting addresses are found in the SuperBASIC system variables area. Their offsets are \$18 (\$V.NTBAS) and \$20 (\$V.HBAS) respectively. Both are 16-bit numbers. Their ending addresses are found at offsets \$1C (\$V.NTPE) and \$24 (\$V.HPE).

The Name Table is composed of blocks of eight bytes. This block contains information on the type, a pointer to the location in Name List, and a pointer to the value. See Table 1 for a complete breakdown of this information.

Let's now look at the *calc* routine of the code. The comments accompanying the first few lines of this routine are misleading. The result of *move.l \$16(\$A6),A1* does not retrieve the actual address, only the offset from A6. By adding A6 to A1, the actual ending address of the table is found. Since the SuperBASIC variables we wish to pass to the machine code program are floating point, we are looking in the Name Table for the occurrence of "\$0202" (see Table 1). The actual names are stored in the Name List with one byte for the length of the name, followed by the ASCII of the name. Checks are made through the Name Table for floating point variables. If one is found, its entry in the Name List is calculated and a check for either *cf* or *cz* is carried out. By declaring the machine code variable space as a long word of 0 and by transferring the data from the Name List into the first 3 bytes of space, we can have a long word check against D1 and D2 (see section labeled *float*). The Name List is not arranged in a normal 48000 manner. It is customary, in 68K assembly language, to insure that all addresses be on word boundaries (i.e., even addresses). When found, the addresses of the actual floating point values are stored in the appropriate machine code spots.

Floating point variables are stored in the GL with six bytes for a 16-bit exponent with a 32-bit mantissa. Integers are stored as two's-complemented words. The GL stores strings with the first word defining the length of the string, followed by the actual string itself. If the string is an odd number of bytes long, it will be stored with a spare byte to adhere to the normal 68K convention of word boundary addresses. Array storage is rather complex. There is one long word as a relative pointer to the actual start of data. This is followed by a word for the number of dimensions. For each dimension, a pair of words is used which define the dimension along with an index multiplier for it. This preamble is followed by the actual array, using the same format as stated above for integer, floating point, or string.

set up
The first portion of this section moves the actual floating point data from the SuperBASIC variable area into machine code variable area. We are now ready for our first voyage to the GL ROM via Vector utilities—floating point math.

Before any calculations are carried out, a check for ample space on the maths stack should be performed. This is accomplished by the Vector utility *WIA (\$V.CHNIX)* - reserve space on maths stack. Upon entry, D1 should contain the number of bytes needed (as a long word). When exited, the following registers are affected:

D1 corrupted	A6 preserved
D2 corrupted	A1 preserved
D3 corrupted	A2 preserved
	A3 preserved

If there is insufficient space on the stack, this Vector call will expand it. This may entail moving the stack's location. The location of the stack is found by checking the SuperBASIC variable *BU.RIP*, which has the offset from A6 of \$5B.

highop

Floating point routines, within the GL ROM, are accessed by two different Vectors, *RI.EXEC* - \$11C for one operation and *RI.EXEC2* - \$11E for a list of operations. Upon entry, the following registers should be set up as follows:

D8,D9	operation code (RI.EXEC only)
D2	set to 0 to insure reliable execution
A1	pointer to maths stack (relative to A6)
A3	pointer to the list of operations (RI.EXEC2 only)
A4	pointer to base of variable area (relative to A6)

The following registers are affected by the call:

D1 preserved	A6 preserved
A1 preserved	A1 updated pointer to maths stack
D3 preserved	A2 preserved
	A3 preserved
	A4 preserved

An error report -18 in D0 will indicate an arithmetic overflow.

See Table 2 for the various math functions available. All results of the math operations will be found on the top of the stack. *RI.SUP* (duplicate) is the only operation, in that it will increase the stack by one item and update the stack pointer leaving two items on the stack. The first four remove the first item on the stack and replace it with the result. The next four (along with *RI.POPHPS*) take both items on the stack and replace them with one item and thus decrease the size of the stack. The remaining functions will remove the top item on the stack and replace it with the result. To use the *RI.EXEC2* (list of operations), A3 should point to the list of bytes (operands). This list must end with \$00.

All of the math operations carried out by this portion of the code have stack items on the stack, though ROM was reserved for 4 floating point numbers. This allows us to leave certain items on the stack and by changing the stack pointer, carry out another operation. Finally, this new result can be combined with other items left on the stack for further math operations. This saves the need of pulling items off the stack, storing and retrieving them when needed later. Scan the code between *highop* and *check* and see if you can trace this manipulation of the maths stack. (Refer to the first article in this series to see a BASIC version of the calculations being carried out by this portion of the code.)

The remainder of the Macintosh Source Code should be fairly self explanatory.

SNAPSHOT SOURCE CODE

IMPORTANT NOTE! There is a major error in both the source code and the BASIC loader (listing 4, TSM Nov/Dec '87) for the Snapshot machine code routine. A "type" reversed two numbers in the source code. In the source code, lines labeled *maxsize* and *minsize* should read 131064 not 131046. In the BASIC Listing (see lines 1000 and 1020) "*\$82B,1,-4,14890*" should read "*\$82B,2,14,14890*". My apologies to all who could not do-bug this careless error.

This is a straightforward piece of code. It reads a group of bytes from a certain section of the screen's memory map and stores them in a variable area contained in the machine code program. My approach to accomplish this was rather amateurish, but quick and dirty. To find the actual starting point for the upper left-hand corner of the mini-window area, I POKE'd numbers into the screen's memory until I found the exact point the screen's memory starts at \$20000 or 131072 and is a total of 32K long. The actual screen grid is 128 bytes wide and 256 bytes high. The mini-window is 24 bytes wide and 34 bytes high. The window starts 14 bytes from the start of the screen and is 24 bytes wide. By adding 80 to the last address of the window's scan line, we will be exactly 1 line below the start of the previous location (for a total of 128 bytes). The paste routine reverses this process by moving the copy of the mini-window area back to the screen.

start
This machine code module contains two separate routines. One, *start*, plots the mandelbrot map from already compiled data. The other one, *plot*, draws the map while it is being calculated. The first section of code (*start*, *a_loop* and *z_loop*) runs through the already calculated data, setting the proper ink color and plotting each point to the screen. Let's examine the various subroutines used by both routines.

convert
This subroutine is a maths operation executed by calling the RIEXRC Vector previously discussed. Before we can plot a point to the screen, the x and y coordinates must be in floating point form.

ink

The color attributes for any window can be set by calling one of three Trap 83 routines. They are:

```

83.SETPA --- 80W827 --- paper color
83.SETST --- 80W828 --- strip color
83.SETIN --- 80W829 --- ink color
Upon entry, the following registers need to be set accordingly:
D1:W color
D3:W timeout (-1)
A0:L channel ID
Upon returning, the following registers are affected:
D1 preserved A0 preserved
D2 preserved A1 corrupted
D3 preserved A2 preserved
Errors: -1 not complete or -4 invalid channel ID

```

Channel ID's in machine code are not quite the same as Channel #'s in SuperBASIC. The Channel Table contains pointers to channel definition blocks within the common heap (or \$FFC00000 if the channel is closed). The channel ID consists of two words. The low word is a reference to its location in the Channel Table and the high word is the tag number. Every time a channel is opened, its tag number will be one greater than the previously opened channel. When the GL is fired up, 3 default channels are open. \$00000000 is SuperBASIC channel 80 (the lower window), \$00010001 is SuperBASIC channel 81 (the print window), \$00090002 is SuperBASIC channel 82 (the list window). No matter what the SuperBASIC channel # is for the next channel opened (i.e., 832), it will almost certainly have the channel ID of \$00030003. The Mandelbrot program uses the default window 82 to display the mandelbrot map, making calculations of the channel ID a snap.

This section of code uses the color data POKED into memory by the SuperBASIC program (lines 2830 and 4250). The distance point from the mandelbrot set (i to 255) is used as an index pointer to the appropriate color in this table.

plot

Graphic routines from within machine code are also accessed through Trap 83 functional:
 80.POINT --- 80W830 --- plot a point
 80.LINE --- 80W831 --- draw a line
 80.ARC --- 80W832 --- draw an arc
 80.ELIPSE --- 80W833 --- draw a circle or ellipse
 80.SCALE --- 80W834 --- define scale and origin
 80.OCUR --- 80W835 --- define text cursor position
 Upon entry, the following registers must be prepared:
 80.W timeout (-1)
 A0:L channel ID
 A1:L maths stack pointer
 Upon exit, the following registers are affected:
 D1 corrupted A0 preserved
 D2 preserved A1 corrupted

Each of the functions require that certain parameters (floating point form) be placed on a maths stack pointed to by A1. This stack is also upside down. To insure successful operations of the functions, there should be 240 bytes free on the stack. See Table 3 for the parameters which must be on the stack (relative to A1) for each of the graphic routines.

start2

Unlike the routine at *start*, this routine only plots one point at a time, updating the machine code variables for the x and y coordinates before returning to BASIC. It also uses the same subroutines detailed above.

Some of the variables used by this code may have been POKED into their location from SuperBASIC (array, *a_point*, *a_color*). This is another round-about method of passing parameters from SuperBASIC to machine code.

I hope this article will be a start for the aspiring \$8000 machine codists. There is a great potential lurking in the heart and soul of the GL, and most of it is easily accessible via machine code. I feel that 68K machine code is much more flexible and dynamic than Z80. (Hum, now, if any of you Z80 fans have gotten this far, don't count me as an ex-Z80 buff. One will still find me hacking away at the old Silver Avenger--TG2068!!) With the availability of a large number of Traps and Vectors, such of the chore of coding in assembly language has been removed. Once again, I would like to apologize to any who may have lost a few nights sleep due to the error in the Snapshot code.

Due to the length of the source code listing of Michael Carver's Mandelbrot machine code subroutine, this listing will be included next issue, when this series concludes.
 _ editor

Bibliography:

- Benning, Adam *Advanced GL machine code*. Duchworth, 1985.
 Bendoff, Martin *Machine code programming on the Sinclair GL*. Hutchinson, 1985.
 Kane, Gerry *68000 microprocessor handbook*. Osborne/McGraw Hill, 1986.
 King, Tim *Programming the 68000*. Addison-Wesley, 1985.
 Krantz, Donald *68000 assembly language techniques for building programs*. Addison-Wesley, 1986.
 M86800: 8-16/32-bit microprocessors programmer's reference manual. Prentice Hall, 1986 (Available from Motorola -- check your yellow pages for a representative.)
 Pennell, Andrew *The Sinclair 6800 companion: a guide to the GL operating system*. Sunshine, 1985.
 Williams, Steve *Programming the 68000*. Sybex, 1985.

TABLE 1 -- Variable types

WORD	defines the type of the name
UNDEF	undefined string variable
UNDEF2	undefined floating point number
UNDEF3	undefined integer
STR	string expression
FP	floating point expression
INT	integer expression
VAR	string variable
FP2	floating point number
INT2	integer
STR2	substring (used internally only)
STR3	string array
FP3	floating point array
INT3	integer array
PROC	SuperBASIC procedure
STR4	SuperBASIC string function
FP4	SuperBASIC floating point function
INT4	SuperBASIC integer function
REP	REPEAT loop name
FOR	FOR loop counter (floating point)
MAC	machine code procedure
MAC2	machine code function
WPF	pointer to entry in name list (or -1 if expression)
LONG	long

pointer to entry in name list (or -1 if expression)
 long
 For SuperBASIC procedures and functions, the high word is the line number of the DEF statement. For machine code functions and definitions, the long word is the absolute address of the routine.

TABLE 2 -- Floating Point functions

OPCODE	NAME	FUNCTION
002	RI.MINT	INT floating point into word integer
004	RI.LINT	truncate floating point into long integer
006	RI.M.LINT	INT floating point into word integer
008	RI.LINT	Convert integer into floating point
00A	RI.ADD	add TOS to NOS
00C	RI.SUB	subtract TOS from NOS
00E	RI.MULT	multiply TOS by NOS
010	RI.DIV	divide TOS into NOS
012	RI.ABS	take absolute value
014	RI.NEG	negate
016	RI.DUP	duplicate

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022	RI.ACOS	arccosine
024	RI.ATAN	arctangent
02A	RI.ACOT	arcocotangent
02D	RI.SQRT	square root
02A	RI.LN	natural logs
02C	RI.LOG10	base 10 logs
02E	RI.EXP	exponential
030	RI.POWFP	take NOS to TOS

TABLE 3 -- Graphic function parameters

SD.POINT	000(A1)	x co-ord
	000(A1)	x co-ord
SD.LINE	000(A1)	y co-ord of end of line
	000(A1)	x co-ord of end of line
	00C(A1)	y co-ord of start of line
	012(A1)	x co-ord of start of line
SD.ARC	000(A1)	angle of the arc
	000(A1)	y co-ord of end of arc
	00C(A1)	x co-ord of end of arc
	012(A1)	y co-ord of start of arc
	012(A1)	x co-ord of start of arc
SD.ELIPSE	000(A2)	angle of rotation
	000(A1)	radius
	00C(A1)	eccentricity (1 if a circle)
	012(A1)	y co-ord of center
	010(A1)	x co-ord of center
SD.SCALE	000(A2)	x position of graphics origin
	000(A2)	y position of graphics origin
	00C(A1)	scale factor
SD.CUR	000(A1)	graphics x co-ord
	000(A1)	graphics y co-ord
	00C(A1)	horiz. pixel offset of cursor
	012(A1)	vert. pixel offset of cursor

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TAX-I-QL/87, PACIOLI and THE SPY

by Mike de Sosa

Sounds like a spy thriller, but the title really refers to an income tax preparation program (in the nick of time), a personal or small-business double-entry accounting system, and a revolutionary multi-taskable, multi-file, universal full-screen editor—all for the Sinclair QL.

EMSOFT'S TAX-I-QL/87 * * * * 1/2

TAX-I-QL/87 is a rather complex IRS Form 1040 template designed to simplify tax preparation by individuals or tax-form preparers. It replaces TAX-I-QL, which had to be rewritten from scratch. It is used with either QLISE version 2.1 or ABACUS version 2.3 and a QL with at least 256K RAM. Few instructions are on the template, and most instructions must be read from IRS forms, but this should remove a little drudgery from the process, satisfy your soul, and leave you a good record with which to impress your IRS tax auditor.

The disk version can print to IRS forms but the Microdrive version will not.

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A.R.K. Distributions THE SPY * * * * *

A.R.K.'s THE SPY is from Richard Howe and these wonderful folks who gave us ARCHVIST. THE SPY is billed as a multi-file, multitaskable, universal full-screen editor. Not a word processor, the program "is designed primarily for programmers who want an editor which EXECs quickly, multi-tasks, and takes as little space as possible (in RAM) while providing all the fundamental editing facilities at the highest speed."

THE SPY lives up to this billing and more. A.R.K., for Applied Research Kernel, Distribution is in the business of designing and retailing business software, and their latest product is another good piece of work. 500K of assembler source language have been compiled onto about 200 Microdrive sectors. The people at A.R.K. believe that in the future most small computer systems will be emulated faster on Transputer-based home micros, and, if so, computer owners may be freed from the whims and follies of computer companies.

What can THE SPY do? It can load and stack as many files (programs) as your QL RAM permits, allocate working space to each, and transfer blocks of code (from assembler language to SuperBASIC) locally within files or globally between files. Files can be of any type from binary to text. It commands functions using a single keypress or combination keypress, that is, CTRL B to drop the BLOCK menu or CTRL Z to zap the current file from the stack. Other commands are via the function keys. Extrremely rapid operation is possible, shifting between screens of code and moving or correcting blocks of code semi-automatically. THE SPY can, for example, load itself, customize itself, and then replace itself—something like a Phoenix.

THE SPY is said to be compatible with QRAN, KEYDEPIKE, and probably with other master multitasking programs. (The software arrived too late to test its operation with other such programs and its price was not mentioned, but Mark at SHARP's should have the "straight skinny" on price and compatibility by the time you read this.)

* Transputer. A firmware/hardware addition for microcomputers that will vastly increase their speed of operation and versatility so that computers like the QL might become virtually obsolescence proof. Leon Heller, editor of QUANTA, has been working on this revolutionary development for some time.

ZEATALINE's PACIOLI * * * * 1/2

PACIOLI is a double-entry book-keeping system designed to enable the individual or small-business man to manage his own finances in a comprehensive way with a minimum of effort. PACIOLI is menu-driven and straightforward to use, and learning to use PACIOLI is a liberal education in double-entry accounts-keeping. The program also computes several financial ratios such as net profit percentage, capital circulation, and annual growth rate. Screen and printout representations of bar- and pie-graphs are available. The significance of the name PACIOLI escapes me. Distributors should check with me for U.S.A. wholesale prices. Individuals should check with their distributor or write to Zeateline Projects Ltd., 3 York Close, Waddingborough, LINCOLN, LN4, 1BQ. Looks like a winner! About \$30.

NEXT TIME. Full information on lots of exotic new software that is supposed to be on the way.

Why the QL?

Now is not the time to give up on the Sinclair QL!

by Mike de Sosa

A number of people have said that the Sinclair QL is dead—that there is no point in upgrading to the QL or in sticking with it any longer! These nay-sayers can be more wrong. Following are just some of the reasons why you should upgrade to the QL or stick with it:

1. The Sinclair QL package is, quite literally, the best value for money of any professional computer.
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3. Second- and third-generation QL software—for more affordable and in many cases better than most big name brands—is now available.
4. Many QL users who use big-name brand minicomputers and personal computers at work much prefer the QL for many reasons.
5. Low-cost and innovative QL firmware and hardware which fully utilizes the QL's great power is only just now approaching fully developed status.
6. The QL Users and Tinkerers Association (QUANTO) Library now provides 20 quad-density floppy disks containing QL software and documentation of all types and descriptions at very low cost to members—contact Tom Bent between 7pm and 10 pm EST at (301) 734-7187 for further information on QUANTO, its excellent monthly newsletter, its massive members' software library.
7. The T/S 2668 is an excellent computer which has given us great service, but it lacks the necessary capacity to run comprehensive database, spreadsheet, desktop-publishing, and integrated multitasked programs. The QL with TRUMP CARD uses 85% of RAM!
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Prepared using PAGE DESIGNER 2—looks like the Macintosh!

Why the QL?

Now is not the time
to give up on the Sinclair QL!

by Mike de Sosa

About four years ago I wrote an article for *Reader's Digest* (never published) about the new Sinclair QL microcomputer. I entitled the article "The First Lightweight, Low-cost Supermicrocomputer," and promised that the QL would soon revolutionize the computer world, including the training of computer users, financing, and logistics. And the QL promised to do just that, but a few things went wrong: early models of the QL and early versions of its bundled software were just not ready for release, resulting in some bad reviews; Sir Clive's marketing strategy left many things to be desired; the U.S. distributor, though personally helpful to me, was poorly organized and refused to advertise--the statement was made, "We don't need the U.S. market"; the Reagan administration held up FCC clearance for seven months crucial at the time; computer sales went flat; Sir Clive almost went broke because of his electric tricycle and had to liquidate his QL brainchild; etc.

The Sinclair QL and its bundled software, is now "fully developed" through the efforts of Peios Ltd. and third-party firmware designers, notably Tony Tebby, and its price has dropped from \$500 to under \$100.

The QL remains the first lightweight, low-cost, supermicrocomputer. Many computer experts--regular users of Apple, IBM, Texas Instrument, and other PCs--have visited me and marvelled at what an intelligently augmented QL can do. (They even like the keyboard and Microdrives--unique to Sinclair--which many have previously knocked.) When I tell them what the computer and its allied software, firmware, and hardware cost, their jaws really drop! For many of the same reasons that the QL was to have revolutionized the computer world in 1984, it remains an extremely versatile, almost obsolescence-proof computer (remember the term *transputer*--a new device which will, among many other things, permit the emulation (and input/output to) any type of computer, permitting the true universalization of computers--it's coming soon for the QL.)

What I'm trying to say is that the QL is an excellent machine that, when properly upgraded, will allow you to join the computer revolution and remain "state of the

art" for the foreseeable future--and this at the very lowest cost!

Many other reasons for sticking with or upgrading to the QL are listed on the facing page, and I could go on listing them all day, mainly in connection with the many outstanding classic and new software programs now available. Did you hear that Peios Ltd.'s QL CHESS, running on the QL, won the World Microcomputer Chess Championship for the third time?

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ZX PRO/FILE (Prod# TS1PF) \$19.95 (TS1000). A machine language information storage and retrieval tool for 16-64K. Written by Thomas B. Woods. Multi-word search capability, instant file access, ordered displays, definable printer functions, totally flexible file size, 39 page tutorial manual. This is the finest data base program ever written for the TS1000/1500 and Sinclair ZX81.

ZX PRO/FILE

AC2 GENERAL LEDGER 1.000 (Prod# AC21) \$19.95 (TS1000). An accounting system which is designed to meet the accounting needs of a small business.

AC2 General Ledger

AC2 GENERAL LEDGER 2.000 (Prod# AC22) \$19.95 (TS2068). An accounting system designed for the small business. The AC2 2.000 is flexibly designed so the reports fit your business whether it is a proprietorship, partnership or corporation. There's plenty of capacity with up to 150 named accounts and up to 800 entries and accounts each month. Includes a 20 page manual that will get you up and going in no time. For use with the TS2068, a 2040 printer is optional.

Colonize the Universe

COLONIZE THE UNIVERSE (Prod# TS2COL) \$16.95 (TS2068). Winning this game requires cunning, poise and a bit of luck. Try to build up your space colony in order to survive. Fuel and food are scarce and must be watched constantly in order to survive. Aliens, Black Holes, Super Nova Explosions and Time Warps are also abundant. This game is just like a galactic Monopoly game. It's great fun and provides hours of entertainment! We highly recommend this game!

The Dealer's Den

THE DEALER'S DEN (Prod# TS2DEN) \$16.95 (TS2068). If you love to play poker than this is the program for you. You play Draw Poker as you have seen in the arcade games at your local night club. You can also play four hands of Draw Poker against the dealer's one hand. Great Graphics make this software package a must for any computerist who loves Poker! Contains two programs: THE DEALER'S DEN and DRAW POKER.

PRO/FILE 2068

PRO/FILE 2068 (Prod# TS2PF) \$29.95 (TS2068). A professional file and database manager for the 2068. Instructions are displayed on the screen and guide you through the steps. After you have saved some files, you can access them by typing in any word, or group of numbers in that file. A 100+ page manual is included detailing the many uses - with instructions for use with a full size printer. The best data base system available for the TS2068. Just ask anyone who uses it.

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